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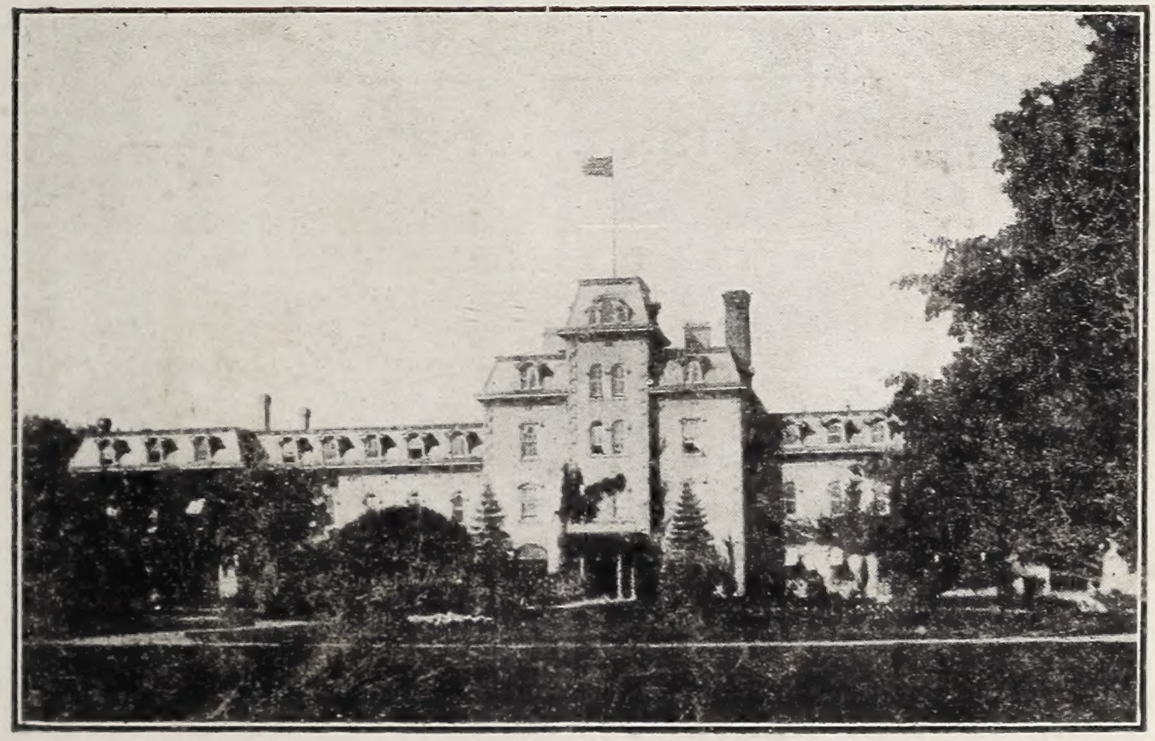

August, 1921

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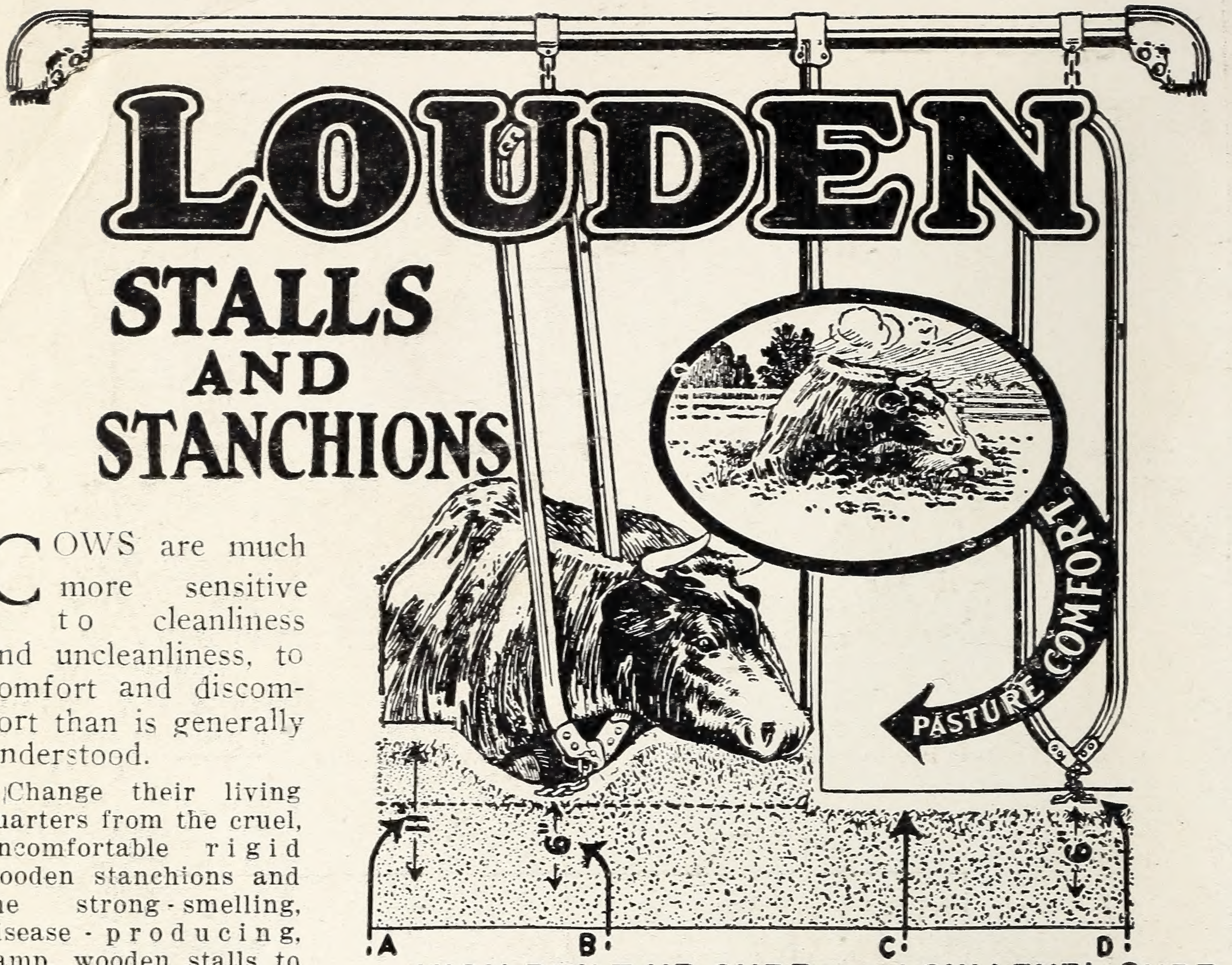

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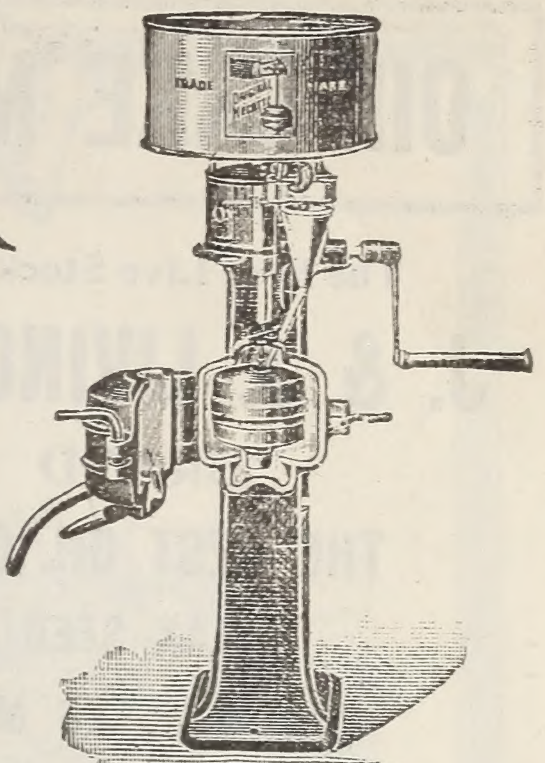

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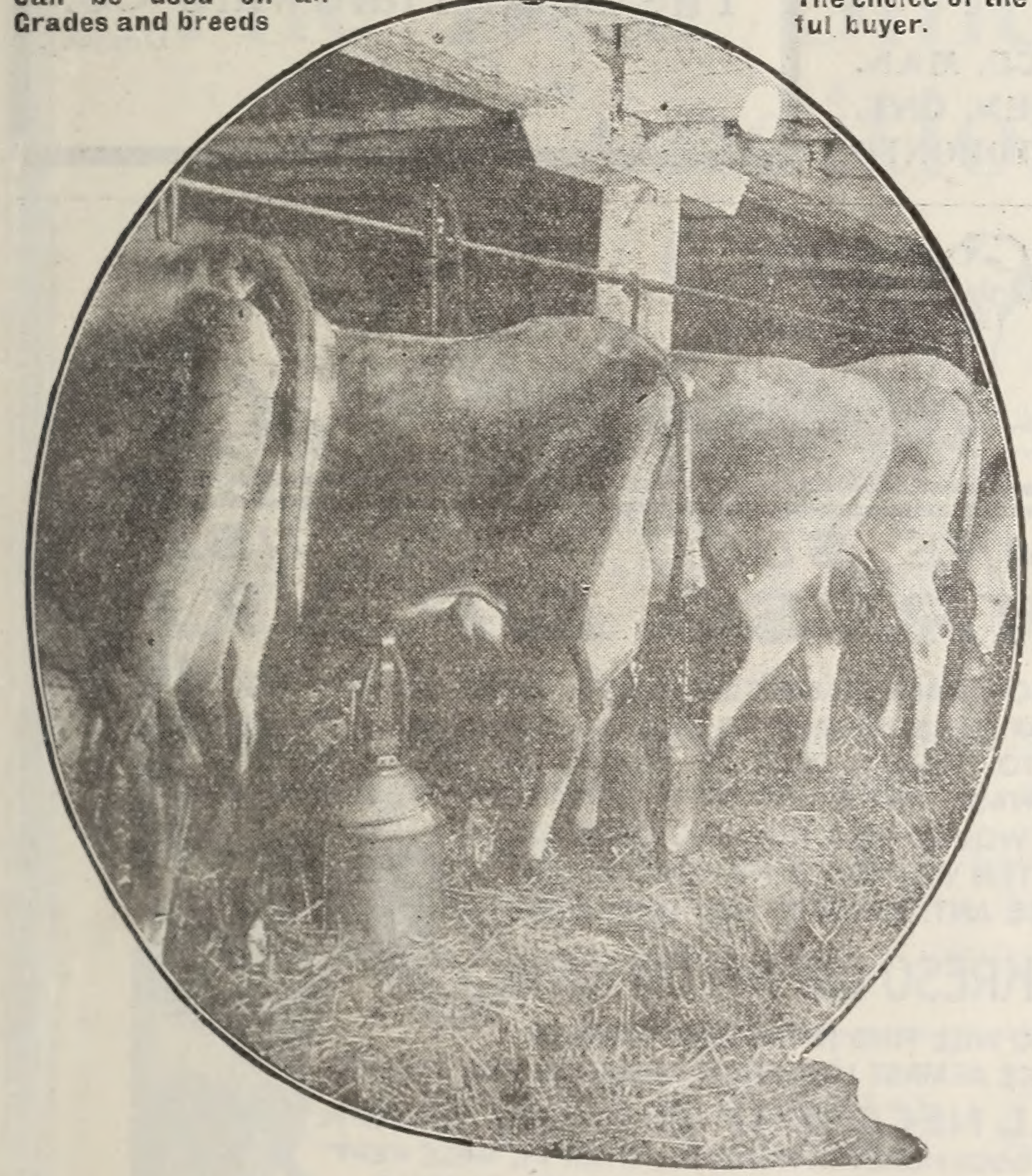

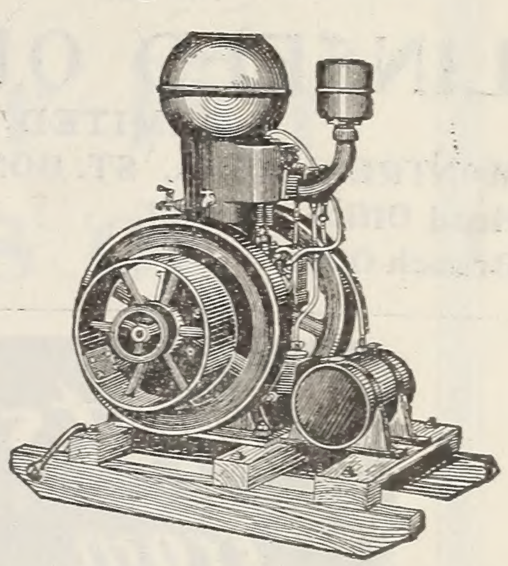

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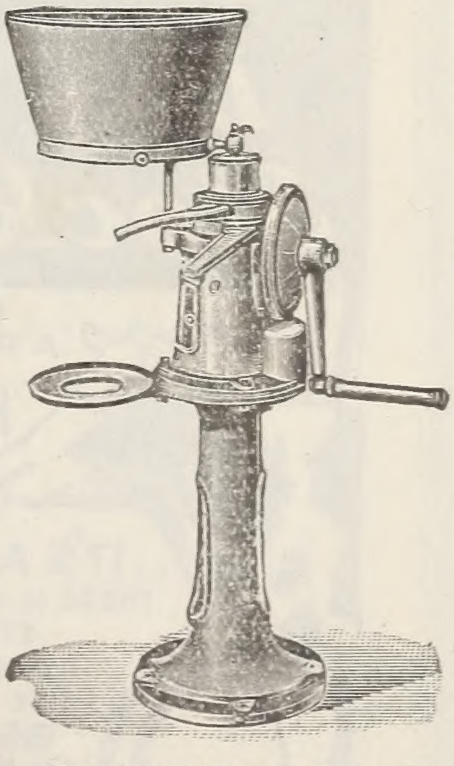

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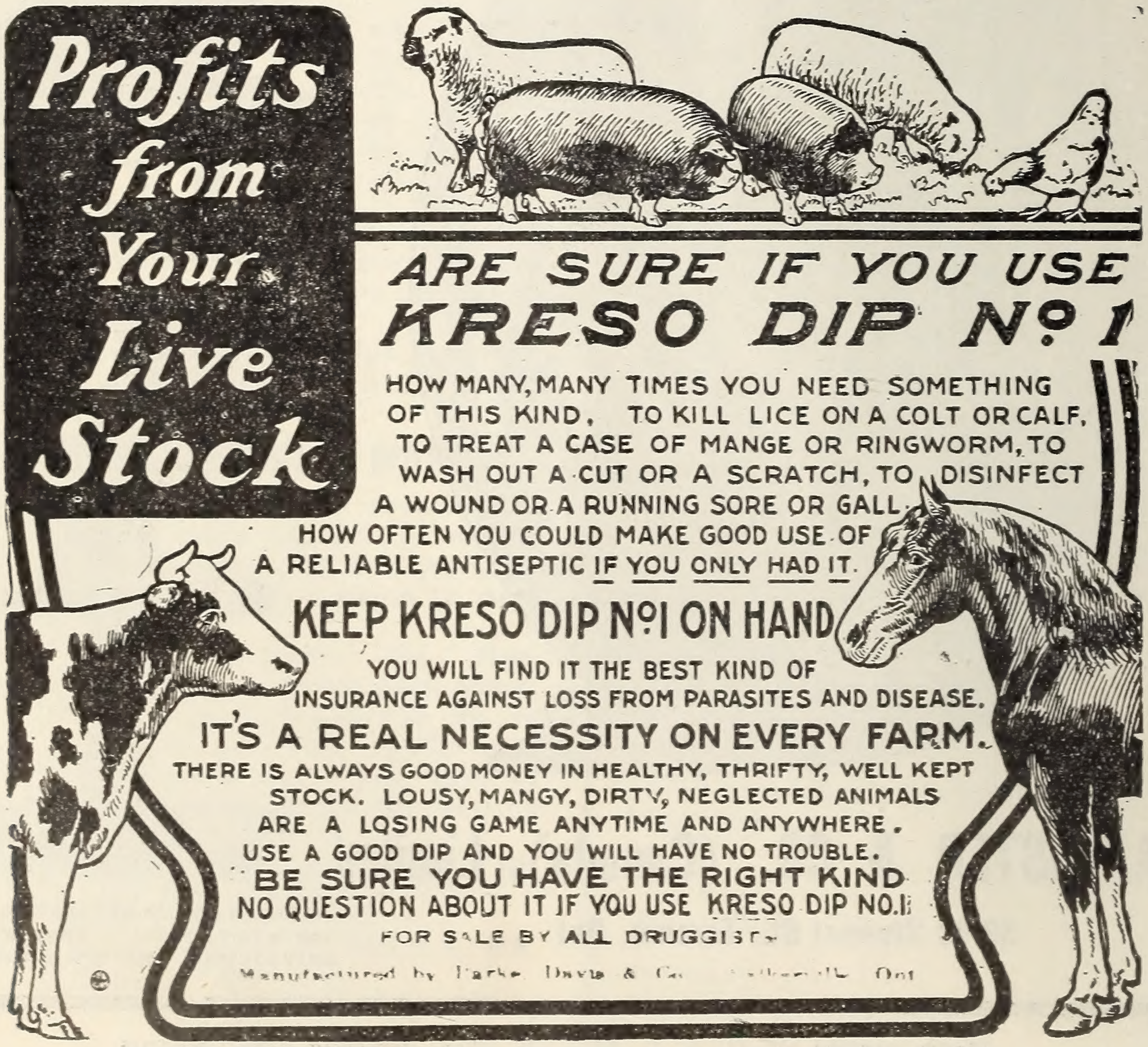

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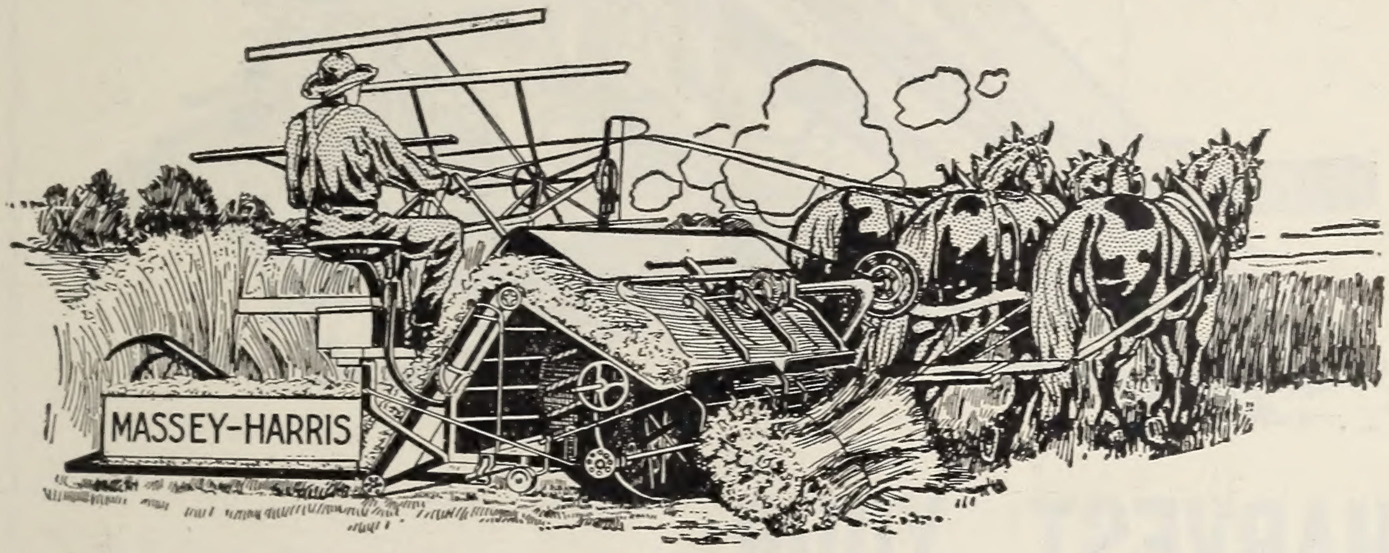

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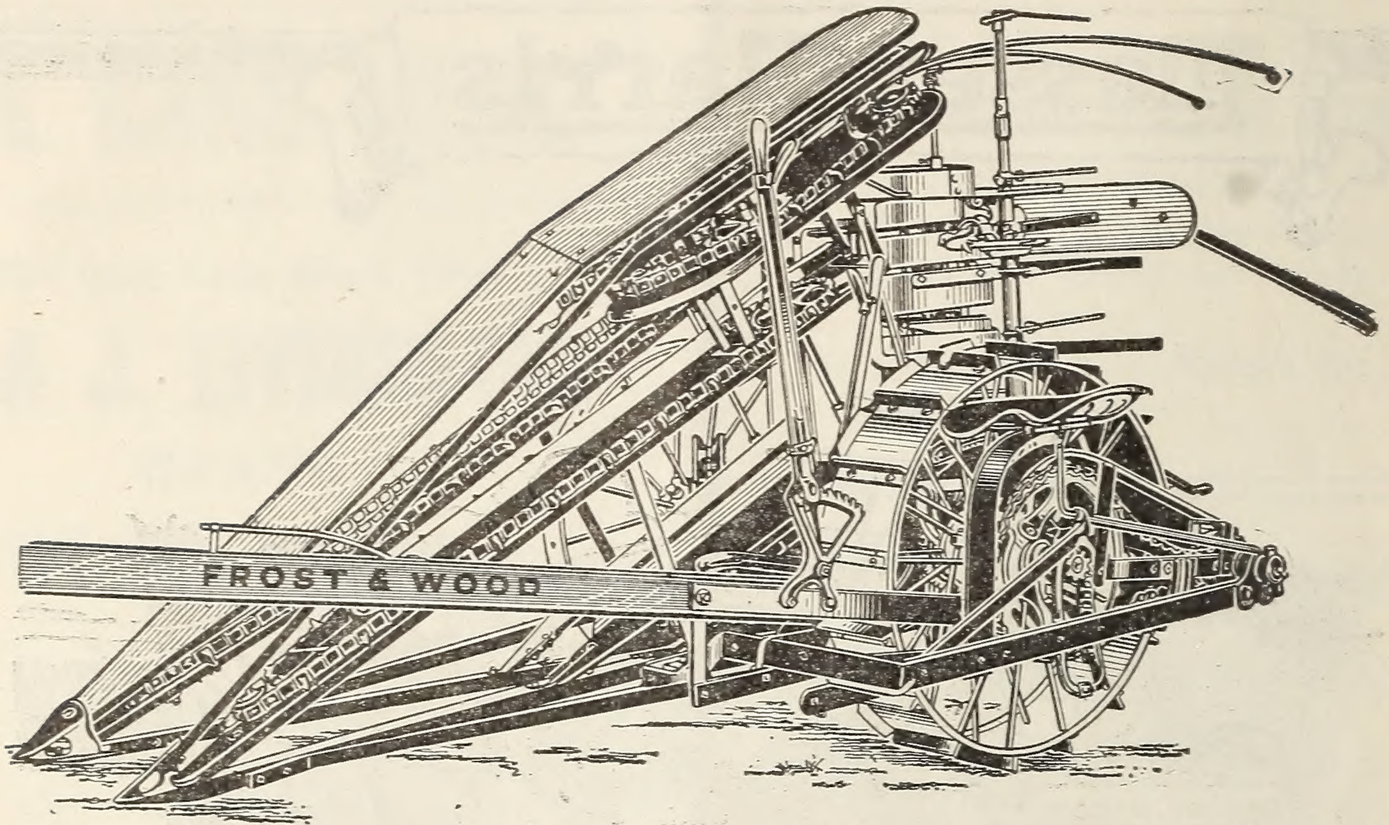

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THE O. A. C. REVIEW

"THE PROFESSION WHICH I HAVE EMBRACED REQUIRES A KNOWLEDGE OF EVERYTHING"

VOL. XXXIII. AUGUST, 1921 No. 12

The Local Agricultural School

By J. B. SPENCER, B. S. A.

HALF a century ago the agricultural needs of our rural people were almost negligible. We were then in the pioneer stage. To-day education is a prime requisite for success in agriculture. We are now past the pioneer period and are striving for larger returns from labour, and a fuller, more contented rural life for our families. To secure larger returns it is necessary that we learn how to farm properly; to acquire the fuller life in the country we must know our duties toward our fellow men. The growing and husbanding of corps is important, but a broad culture for every man, woman and child is more so if life and labour in rural communities is to be remunerative and otherwise attractive.

The Canadian rural problem is largely a question of agricultural production. To bring about better living conditions we must revise our methods of agriculture. Soil exploitation must be superseded by scientific tillage based on known principles; the fertility of our fields must be maintained, and depleted soils must be built up. In short, our youth must be schooled in the science and art of farming. Scientific agriculture is a partial problem only; we must go further. Our rural people are not living to themselves alone, as in pioneer days. It is now our duty to understand our social problems, which are many, and these must be solved in order that country life will attract and hold an adequate population.

To bring about the betterment of rural conditions necessitates the preparation of leaders who must be trained, in theory and practice, for their work in rural communities. These leaders must know conditions as they actually exist; and who are better able to grasp the situation than the sons and daughters of the farm? These men and women, when given the advantage of an education, will accomplish this purpose. But here is our difficulty; colleges and universities are closed to these people who have not had the required preparatory education. Their elementary schooling is deficient. They know nothing of high school subjects and they have not complied with the entrance requirements to higher institutions of learning. In many cases the most capable of the young people have already reached maturity, and cannot be expected to go through the years of preliminary training necessary to fit them for a college course. Some other scheme of training is required.

Alberta has grasped the situation and is preparing leaders in her schools of agriculture. She realizes that to-day education is the prime factor in rural progress. Her schools of agriculture are endeavoring to enlighten the farm boys and girls on whom the country depends for the production necessary to keep pace with the demands made by the industrial world.

In other provinces we find this problem is a live issue, and educationists have searched for a suitable system of schools wherein the country folk may be trained for their life work, and for good citizenship. The educational system of Denmark, the land of enlightened farmers, has made a strong appeal to Canadians. This system has lifted the peasantry to a prominent place in the national life; it has shaped the agricultural policy of the people, and has raised Denmark to an exalted position among the producing nations of Europe The principles which have contributed to the agricultural prosperity in that country are worthy of our emulation.

The local agricultural schools of Denmark, numbering twenty-three regular and three special institutions, as well as a dozen schools of household economy, have sprung from the folk high schools. With their contiguous experimental farms they form a system of rural education centres complete enough to furnish a broad general culture, properly balanced with the practical and technical. Students from nineteen to thirty-five years of age, whose preliminary training is equal and whose interests are similar, attend and study for the pleasure of learning what will fit them for their life work. These young folks become self-reliant and well developed mentally and physically. The dormitory plan of student life gives them the assurance and poise necessary for leadership while the gymnastics and farm practice maintain physical vigour. The product of these institutions is their best recommendation.

On his return from a recent trip to Europe Dr. J. W. Robertson expressed himself strongly in favour of a system of education for the farming people of Canada such as is followed in Denmark. The young men and women of Canada's rural districts need the training procurable through a term or two in an agricultural school where similar interests and a common endeavour are spurring the whole student body on to higher achievement. The dormitory life enhances their ambitions, weans them from the petty non-essentials of life, and, through the exchange of ideas among the consolidated group of students in a wholesome environment, each one learns to consider the views of the other. It is not advocated that we accept the Danish system literally, but we can with profit adopt her principles of education and build up, on a similar foundation, a super-structure which will meet the needs of our rural communities. The schools of agriculture in Alberta are based on these principles. They are giving satisfaction, and that they are meeting with the approval of the Alberta people is evidenced by the fact that three similar schools in addition to those already built are now under construction.

In addition to local agricultural schools providing instruction in the fundamental principles of agriculture, they will relieve the congestion at present experienced in some of the agricultural colleges where the enrolment of the first two years is taxing both the staff and the accommodation. The work covered being similar to the two years course at the colleges, these schools would act as preparatory schools for those students who desire to go further and specialize in the various branches of agricultural science.—*Agricultural Gazette.*

* * *

Canadian Literature: A Series

By G. H. Unwin, B. A., B. S. A.

II. Songs of the Immigrants.

FROM 1825 to 1867 a great many volumes of verse were published by men who had come to Canada from the old countries. Only a few of these enter into the present discussion. The affections of most of the immigrants went back, naturally enough, to the land of their birth. We could hardly expect them to have absorbed any distinctively Canadian sentiment because it is doubtful whether anything of the kind existed, except in the embryo. Our country was still very much in the formative stage. Communities were isolated by reason of the enormous distances between point and point, and the scattered racial groups had little chance to become cemented together by a common tradition. The strenuous life of the Canadian-born and the lack of educational facilities operated against the growth of native works and, in this way, the monopoly of literary activity fell to men who had acquired their education and their ideals in other lands.

G. H. Unwin

Among these alien singers there are two or three who should be included in any survey of Canadian literature. There may be more, indeed, but that is a moot point. A good deal of ink has been expended in trying to solve the riddle: "When is a writer not a Canadian writer?" Wilfred Campbell has something to say on that subject, and those who are interested may read his introduction to the Oxford Book of Canadian verse. I do not presume to tackle that burning question here. The three poets discussed have been chosen for different reasons: James McCarroll, firstly, because I like his poetry and secondly because his adult life, from the age of sixteen, was spent in Canada; McLachlan because he was emphatically Canadian in all his sympathies, and was very popular with our grandfathers; and, lastly, Charles Heavysege, because he belongs to Canada as much as to any other country.

James McCarroll (1825-1896)

James McCarroll was born in Ireland in 1825 and came to Canada with his family in 1831. His inclinations led him to journalism and hard necessity kept him there the greater part of his life. Among his contemporaries he was best known as the author of "The Letters of Terry Finnegan," a series of humorous articles on current topics written to Thomas D'Arcy McGee, and published in McCarroll's own paper, which was suggestively named The Latchkey. McCarroll seems to have been a delightful companion and to have endeared himself to all his associates. In 1889 he published "Madeline and Other Poems," in which volume the various poems were gathered together which had at different times appeared in newspapers and other periodicals. McCarroll's poetry was the product of his hours of relaxation and this, if I may express a personal opinion, is the secret of its charm. It is free, gay and unlabored; if at times he uses a word inappropriately we feel that it is because he wrote without much premeditation, on the impulse of the moment. Charles L. Hildreth, in his introduction to McCarroll's volume, says: "Amid the thunder of presses and the myriad-voiced confusion of public life he has found a quiet place within himself, full of flowers and sunlight, the notes of birds and the murmur of streams." Two bird-poems of McCarroll's are given in Mrs. Whyte-Edgar's Wreath of Canadian Song; they are, The Humming Bird and The Gray Linnet. The latter poem is also given in The Oxford Book of Canadian Verse, and is perhaps the most characteristic example of its whimsical humor and delicate fancy. Below I quote two of McCarroll's poems in full, because he is neglected in our new authorities. His verse has that arresting quality which makes one go back to the beginning of a poem and read it again. It is not so much in the words or the phrasing as in some quaint original turn of thought that the charm lies. Being both an Irishman and a journalist, he knew the dramatic value of suspense; and his lyrics always end strongly, sometimes with a quaint humorous twist in the last line. The poem, Dawn, should be read as what it is, the conception of a warm Celtic imagination. Anybody who stops to ask how an angel could hold "tinted shadows in her hands" will miss the effect of the lyric altogether. McCarroll's verse was written to be enjoyed rather than analysed.

The Humming Bird.

Purple, golden, burning mote,
As among the flowers you float
Not a single silvery note
Falls on my ear.
Come, Starlet, tune your dazzling throat;
I pause to hear.

How, hung amid a thousand dyes,
A prism, you glitter in my eyes,
To every bud that round you lies
In emerald set;
A rainbow that the summer skies
Ne'er equalled yet.

But hist! You are not silent, bird;
The air with melody is stirred,
As soft as some low, whispered word
Through breathing strings:
The song denied your throat is heard
Among your wings.

And had it thrilled with more delight,
You are so beautiful and bright,
In gazing, all its sweetness might
Forgotten be;
Its murmuring shadow then is quite
Enough for me.

Dawn.

With folded wings of dusky light
Upon the purple hills she stands
An angel between day and night,
With tinted shadows in her hands—

Till suddenly transfigured there,
With all her dazzling plumes unfurled,
She climbs the crimson-flooded air,
And flies in glory o'er the world!

Alexander McLachlan
(1818-1896)

Alexander McLachlan was a great favourite with his contemparies. His earnest, warm-hearted nature made him many personal friends, and this easy popularity was probably injurious to his development as a poet. His writings have suffered on the one hand from the exaggerated praise of his own generation and on the other hand from the undeserved neglect of the younger people. McLachlan's case, indeed, reminds one of some unfortunate child, whose fond and doting mother wearies the neighbors with long stories of the young hopeful's cleverness. Sheer boredom gradually turns into active dislike of the innocent subject of these eternal songs of praise. McLachlan has been called "The Burns of Canada," an exaggeration which does him no service and is certainly most unflattering to the memory of Burns. Again, in the biographical sketch at the beginning of his collected poems we find the following: ". . . In quiet contemplation and moralizing he reminds us of Cowper and Wadsworth, both of whom he surpasses." This is the height of absurdity as a very short perusal of the authors in question will show. These "boosting" methods are fatal to literary reputations; McLachlan's has suffered unduly from the reaction against overpraise.

The poet's father was a Scotch mechanic of democratic sentiments, a Chartist and a strong advocate in the cause of temperance. Alexander came to Canada in 1840 and settled on his father's farm, but exchanged it, a year later, for a homestead in Perth county. For ten years he labored in the bush, with small result financially, but with cheerfulness and a boundless appreciation of his surroundings. The experiences of these years are embodied in his Idylls of the Pioneers. In the longest of these narrative poems, The Emigrant, he describes the voyage from the old land, the felling of the first elm, the building of the log-cabin and other incidents in the life of the settler. Fire in the Woods is a vigorous description of what must have been a too frequent experience in those days. These poems of the pioneer are well worth reading. They throw the light of personal emotion on the pages of the past, and give the reader a strong impression of the simplicity and cheerful courage of their author.

In his reflective moods McLachlan is perhaps at his best. His appreciation of natural beauty is deeply tinged with the imaginative passion of the Celt. He cannot understand why so many men take so little pleasure in their surroundings. In the poem, Neighbor John, he expresses the impatience of the idealist with the limited view of his hum-drum practical neighbor.

Talk not of old cathedral woods
  Their golden arches throwing;
John only sees in all those trees,
  So many saw-logs growing!

To McLachlan the mysterious power of God was clearly manifested in the outward forms of nature, mountains, valleys, sky and sea, flowers of the field and creatures of air and earth. It is indeed a pity that he had so little opportunity, or even inclination, to train himself in the art of expression, for he obviously had the finest natural equipment for poetry. Some passages are alive with genuine emotion; you seem to catch in them something of the poet's own exaltation. Thus, in the poem entitled God we have the following fine stanza:

Nature's sweet heart rejoices
And the rivers lift their voices
    And the sounding sea;
And the mountains, old and hoary,
With their diadems of glory
    Shout, Lord, to Thee.

On the other hand, one is constantly being tripped up by some such absurdity as the following, taken from the same poem:

> In agony the mountains call
> And ocean bellows throughout all
> Her frightened zones!

It is this unevenness that prevents McLachlan from occupying a higher position in literature. If he had written less and studied his art more, his work would have lasted longer.

From 1850 to the year of his death the poet devoted most of his time to writing and lecturing. He lived first in the village of Erin and later moved to Orangeville, where he died in 1896. McMurchy, in his book on Canadian literature, gives a pen-picture of McLachlan as he saw him at Erin. "He was a man of average height, spare build, blue eyes and abundant hair. His face carried the beauty of thought."

Alexander McLachlan's influence on his contemporaries was very great. Like McCarroll he was a friend of the great Thomas D'Arcy McGee, who, in 1862, secured for him the post of Government Emigration Agent for Scotland. During his lifetime two subscriptions were raised by his admirers, an unusual tribute to a literary man in Canada. He will always be remembered as a lover of justice and truth, a friend of the weak, and a seeker after the higher things of life.

Charles Heavysege
(1816-1876)

The last name under discussion belongs to the most remarkable figure in our literary history. Charles Heavysege, an expert wood-carver, was a Yorkshireman by birth and came to Canada in 1853, being at that time thirty-seven years old. He was employed by the firm of J. W. Hilton, cabinet-makers, of Montreal. During his work at the bench, while his deft hands were busy with his carving, his mind was conceiving and shaping his great drama, Saul. Heavysege had had very little schooling, but he had saturated his mind at two great sources of the English speech, the Bible and Shakespeare. With this equipment the humble carpenter produced a work which created a sensation in all countries where the English language is spoken. Of Saul the Boston Commonwealth said: "It must rank above every dramatic poem written in the English language during the present century."

It is indeed a wonderful production and its vogue, which lasted for many years, was due quite as much to the beauty of thought and power of language as to the fact that its author was a poor carpenter. As a rule these sudden fads in literature are based on nothing more solid than the readiness of the public imagination to be intrigued. Thus Smith, a respectable citizen, writes an excellent novel which nobody reads. Smith gets desperate, takes to drink, robs a bank, fights a battalion of policemen and is finally laid by the heels. The public heart immediately goes out to him. Everybody shouts loudly for his release, clergymen make him the central theme of eloquent sermons, societies besiege the government with petitions in his favour. Some lucky reporter discovers that he has written that extremely psychic tale, Beyond the Uttermost. It is forthwith dusted carefully, brought forth and becomes the success of the year. Learned critics discover in Smith points of kinship with all the great writers of the past and at the same time an indefinable Je-ne-sais-quoi that is all his own. Young men and maidens establish a Smithian cult and call themselves Los Herreros, etcetera and so forth.

This paragraph may seem an unwarranted digression; its object, however, is to establish a contrast. The popularity of Saul was founded on the real merit of the work, though no doubt the unusual circumstances of its composition did stimulate public interest. The dignity of the subject, the choice of a character from Scripture, which has always been a favourite with civilized humanity, but above all the directness and concentrated power of the verse place Saul very high among dramatic productions. A short example will be sufficient to show the strength of Heavysege's verse. These lines have a vigor that is almost Shakespearean.

Saul is seated in his tent with Jonathan, silent and pensive. To them enter Abner and David, flushed with victory, the latter carrying by the hair the giant head of Goliah.

Abner—Now, cousin, now behold a frontispiece,
Such as will Nature not soon make again,
Now scrutinize your enemy in safety.
How like a slumbering lion's head that seems;
I could believe Goliath's spirit dreamed
Again within that dome of cogitation.
Who would not choose to dream in such a chamber,
Although within the precincts of death's palace!
'Tis like some grand ruin overgrown
And half concealed by herbage. View him well,
Upwards from the foundation of his chin.
Observe that shaggy beard, those locks that cover
The hand of David as with coils of chains.
Was't not a sin to kill so fine a beast?

After the success of Saul, Heavysege was persuaded by some misguided friend to give up his carving and take up journalism, a profession which he was too old to learn. He published two more dramatic works, Count Filippo and Jephthah's Daughter. His fame, however, rests on his first drama, Saul. Mr. T. G. Marquis says that he is an English writer rather than a Canadian; yet curiously enough, he devotes nearly four pages to him in his essay on Canadian poetry. All the writers on Canadian literature include Heavysege, and rightly so: in the first place all his writings were produced and published in Canada and, secondly, his themes belong to no partciular region or people but rather to humanity in general. People do not read Saul nowadays; but any student of English should be familiar with the name and life history of its author, who fills an honorable place in Canadian literature. Some good selections from Saul will be found in Mrs. Whyte-Edgar's anthology, A Wreath of Canadian Song.

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A Paper presented at the National Public Health Convention, Toronto

By Dan H. Jones, B. S. A., Professor of Bacteriology.

BACTERIOLOGY is the youngest of the natural sciences. Though it is more than two hundred years since Leeuwenhoeck first observed and tentatively described certain unicellular microorganisms it was not until after the middle of the last century that such minute forms of life were demonstrated to have any economic significance. Then with the pioneer work of Pasteur, Koch, Lister, Warrington, Beyerick, Winogradsky and others it became apparent that human welfare was enormously influenced by their actvities. It was found that they were responsible for the various infectious and contagious diseases of man and animals; that they were the agents of fermentation, putrefaction and decay, inducing spoilage of food materials not properly protected; that many species were necessary in the soil to elaborate the plant food for growing crops and that certain very destructive plant diseases were due to their ravages within the plant tissues; that they were inseparably connected with all forms of life, some being injurious to life, others not only beneficial, but absolutely essential, either directly or indirectly. These were revolutionary truths, the discovery of which as the result of much patient research work on the part of a small but gradually increasing number of investigators resulted, during the last thirty or forty years, in the establishment of the science of bacteriology. As a result of these labors there is now available a wealth of valuable information regarding the nature, occurrence and significance of microorganisms. This information is imparted in relatively small doses at certain of our specialized higher educational institutions, as for instance the medical, veterinary and agricultural colleges and schools of hygiene. While, however, the pursuit of the science of bacteriology as a vocation will necessarily always be the work of the specialist it is eminently desirable that not only the relatively small number of individuals attending such institutions above mentioned should get some training in the science, but that every member of the community should be taught a few at least of the elementary but fundamental truths which the science has demonstrated.

D. H. Jones

Within the last few years something has been done towards this end by occasional articles in the daily papers, by the publication of circulars and bulletins, by public lectures and demonstrations, as for instance in the tuberculosis campaign of a few years ago, and by popular exhibits at our National Exhibition and other places of public resort. These efforts, however, whilst they have undoubtedly accomplished much good, are only spasmodic and at best influence only a small fraction of the general public.

How then shall the public be reached?

In the opinion of the writer the best, if not the only method to attain this end is to have a little elementary bacteriology taught in our public and high schools.

About ten years ago the Department of Education decided to give those public and high school teachers who wished it, more particularly from rural districts, a summer school course in elementary agriculture so that the subject might be taught in the rural schools. Every summer since then we have had at the Ontario Agricultural College, Guelph, several hundred of such teachers taking two years summer school courses. In each of the courses some bacteriology is given; to the elementary or public school teachers about ten lectures and demonstrations and to the intermediate or high school science teachers a laboratory course. To all these students on arrival the subject of bacteriology is absolutely new, but the interest they evince in the work as it progresses is a source of gratification to the instructors, and from the nature of the questions asked and remarks made it becomes evident that in the future these students will be more particular with regard to hygienic measures as in the handling of milk and in the cleansing and sterilization of milk containers; in the canning of fruits and vegetables they will work not by haphazard and rule of thumb but with greater confidence from understanding the underlying principles concerning the nature and control of molds, yeasts and bacteria; in association with cases of infectious diseases they will be more ready to fall in with the directions of the sanitary inspector or M. O. H., and so curtail the danger of spreading disease in the community.

Three years ago the Department of Education decided that the School Inspectors should take the Summer School Course in Agriculture, so that they might be conversant with this new phase of work in the rural schools.

When the first batch of sixty inspectors came in for their bacteriology they expressed some surprise that the subject should be required, as they had not received it even in their university science course. Before the first period was over, however, every member of the class seemed to realize the importance of the truths propounded and their application to daily life, and were keenly eager to get all the time and attention that we could give them during the rest of the course. At the end of the last period they were asked to submit at their leisure a brief note expressing their views as to whether or not some elementary bacteriology should be taught in our public and high schools and the reasons for their views. Every member of the class complied with the request and an examination of their papers showed they were unanimously of the opinion that the subject should be on the curriculum.

The nature of the views expressed may be gathered from the following transcripts:

"The lectures in this course in bacteriology have been a revelation to me and leave no doubt whatever in my mind as to the desirability of having taught in our schools the elementary truths concerning microorganisms. Put as briefly as possible my reasons follow, premising that the schools exist primarily to fit the pupils for the most capable and useful life in the community which they enter:

"I. All infectious diseases of man and animals are caused by the action of microorganisms. Good health is fundamental to successful living, hence the necessity for an understanding of first principles. The science has a direct bearing on the medical inspection of schools.

II. Some knowledge of bacteriology appears fundamental in gaining an intelligent knowledge of the underlying principles of soil fertility, and hence is desirable for successful farming.

"III. The housewife will be wonderfully benefitted by a knowledge of the action of microorganisms in many of her forms of labor in the home, particularly in the preservation of fruit and vegetables and in the care and handling of milk.

"These constitute only a small part of the reasons that might be assigned for the teaching of elementary bacteriology in the public and high schools. It is indispensable, and in my opinion it is a subject in which the pupils could be deeply interested. It will open to them a new and very interesting world of phenomena."

Another expressed himself as follows:

"The microscopic forms of life play an important part in those things that pertain to the health, the comfort and the happiness of individuals, of communities and of nations. Only a few people realize the existence of these minute organisms and fewer still know anything of the work they perform in the economy of nature.

"After listening to the lectures on bacteriology I am convinced that many of the elementary truths of the science not only may be but should be taught in our high schools and in the senior grades of our public schools.

"The facts and theories will interest and benefit the pupils and when carried by them into the homes to be discussed with the parents will prove a blessing in the homes.

"To have an intelligent knowledge of how bacteria effect diseases, decay of foods, cause of dangerous contamination of water, etc., is of much more value to pupils and parents than most of the things learned in our schools.

"The elements of the subject should be included in hygiene and taught in all schools."

Somewhat similar views to the above were expressed on all of the sixty papers submitted, and to say that the inspectors were sympathetic to the idea of having the subject introduced to the public and high school curricula is to state the case mildly. They were most enthusiastic in their support of the movement.

In the early months of the present year the staff of the O. A. C. was requested by the Department of Education to revise the science course in agriculture for high schools. In this revision it was decided to introduce some bacteriology, the subject to be taken in the Lower School the first year, under the headings:

BACTERIA: What they are and where they occur.

Relation to—

Foods: Experiments to show pasteurization and sterilization of milk and of canned foods.

Water Pollutions: Spread of such infectious diseases as typhoid fever; purification of water by boiling; use of chloride of lime as a disinfecting agent.

Infectious Diseases as tuberculosis typhoid fever, diphtheria; discussion of the agents of transmission as house flies, drinking cups, etc.

The course here outlined may not be as complete as is desirable, our original suggestions on the matter having been somewhat reduced in the final revision by the general committee appointed for the task. But it is a beginning, though it applies only to the limited number of students in high schools who elect agriculture as their science subject. As, however, the importance of the subject is more generally perceived by those having the future modification of our school curricula let us hope they will realize the desirability of having a few at least of the fundamental elementary truths of the science of bacteriology taught in all schools. This, of course, would mean that the teachers should get some bacteriology in their preparatory training. This may be difficult to achieve at first. With us at the Agricultural College it was a comparatively simple matter to modify our course in general agricultural bacteriology to meet the needs of the Summer School student teachers getting their training in elementary agriculture. But the problem should not be insuperable. The Departments of Bacteriology or Zymology at University might be able to meet the needs of the case.

When we bear in mind that the life of every individual whether he knows it or not is most intimately associated with microorganisms from the hour of birth until the hour of death, and that his well being may be profoundly modified for weal or woe by such association it seems nothing short of criminal neglect for our educational authorities to refrain longer from including something of the science of bacteriology amongst the subjects taught in our elementary and high schools as well as in certain of our higher educational institutions.

What's The Matter With Farming?

By Augustus Bridle

MOST of what's wrong with farming is that not enough people work at it, and that a great many of those who do are trying to run a modern-machinery plain business and needs plain words. statement is truth; the second sounds like impertinence. But farming is a plain business and needs plain words.

If farmers and townfolk are ever to get rid of their No-Man's Land there will have to be a deal of plain speaking on both sides. When I worked on the farm as a lad I used to think that the fine person who drove along in his fancy rig had a sort of contempt for the clodhopper with the cowbite hat. I used to straighten up behind the harrows or take a tuck in the mowing of fence corners whenever one of those town nabobs in a phaeton with tassels all round the top drove along the town line. But the boot is on the other foot now. I know this because I have observed it. Two weeks ago I had just finished pitching on a load and was going up for a drink to the creek while the next wagon was coming from the barn when a neighbour, who was loading up barrels of water, looked up at the boss on the load and said:

"Say, Hiram, how do you git so many bookkeepers and dudes on this place?"

He grinned as he said it. One of those caustic grins of absolute and quite friendly contempt. That man, I am sure, had tried to hire a couple of city-men by offering them boy wages. He must have got one and found out what an abyss of agricultural ignorance he was. I met one of these tenderfoots on that same farm; a lean, dried-up little shaver who had been hugging barley and oat sheaves for five days, one of which when he shocked barley was a 103 in the shade—and he was never in the shade.

"How do you like farming?" I asked him as he came mooching into an oat-field to shock up.

"Me? Oh, farmin's all right, I guess. But say—barley on a hot day is certainly a son of a gun."

That youth never will be a farmer except by the draft.

Extremes, however, do meet on the farms nowadays. No doubt I was one of them. But I had the nerve to ask a farmer top wages over the telephone, and he had called my bluff. I went. Fifty miles north of Toronto, not far from Lake Simcoe, I was faced with the old, old job I had learned when a youth; one of the jobs that never can change no matter what machinery is invented.

At seven a.m., with two sheaves of wet oats at arm's length for shocking, I looked over the farm and calculated that I was within sight of two million Scotch breakfasts. The farmer with whom I had engaged for as long as he could endure me at the price had 54 acres of oats, which would probably average 45 bushels to the acre.

"Within sight of two million Scotch breakfasts"

Down yonder in the city were half a million people.

At least half of these half million must regard porridge and cream and bacon as a luxurious breakfast. Yonder in the lane were twenty cattle. Rummaging through a nearby oat field were thirty hogs. The farmer was too busy to spend time finding the holes in the fence through which they had wriggled. Harvest and fall apple trees were loaded to the brim; barrels of apples wind-falling, calves and hogs gobbling them up. Turnips, mangolds and potatoes by the acre were bulging up near the barn. Buckwheat was in full bloom. The garden was ripe with squash, tomatoes, carrots and beets.

And a few days ago someone downtown wailed about the possibility of a world famine. Where was it? Not here.

. . . .

Making the acquaintance of porkers is a privilege. And the hogs know it. The adventurous pirates wriggle in everywhere except the kitchen and the sparebedroom. I caught three of them drinking leisurely at a pail of milk. The old-time hog always upset the bucket first and tried to drink the swill afterwards. These experts knew better than to waste food. The place for all available food was inside the hog. I heaved a brick at the trio. They turned to smell the brick and finding it not good to eat turned to the milk again. I kicked one of them in the shoulder. Kick an old-time hog and he squealed for a mile. This one did not even grunt. He turned to look at me severely—

"I am a modern hog"

"You do that again, Mr. Cityman, and I'll have you reported to the Food Board. I am a modern hog."

However, with all the astounding transformations in farm technic, the art of shocking is just what it was forty years ago, except that the binder has a sheaf carrier that dumps the sheaves in a sort of sprawled-out windrow. If you are not too slow, seven acres of good oats is all that you will shock in a day. That cool, damp morning, with the boss and his gang pulling up big stones by a windlass on a huge truck, and the Government tractor snorting its way across a long field plowing for fall wheat, it seemed to me I could have shocked that whole 16-acre field by sundown.

But in half an hour I was soaked to the last stitch, all but the shoulders. I rolled my overalls above my knees and went at it Highlander style. My socks were soaked. I pulled them off. By noon, going barefoot in a pair of new boots, I had a battery of blisters on my feet. In the afternon the binder went again, the stubble crackled and the field was hot. Miles to walk. Thousands of sheaves to lug. But down yonder at the far end of the field and half along one side was the twist of a glorious creek born in the spring of a hill, haunted by a pair of cranes and trailing away somewhere to the Nottawasaga. That creek I would have blessed in seven languages, yes, seventy times seven. Seven times a forenoon it found me down on my flats guzzling up the running water. In the shade of a clump of maple, down in the gorge among the water-cress and the wild-raspberries, out yonder by the jog where the creek scooted under a pole into a cow pasture, again in some other field just beyond the bridge where the water raced over a patch of stones, still again back by the wagon ford, or out in the lane where it became a mere thread in a baby canyon; best of all, as I found out, back by the main-lane bridge at the foot of a clump of cedars, where the cool rivulet raced along the edge of the hill forty rods from the spring that started it from nowhere—at all times and places I made it the second joy in life to guzzle that creek. And whenever I got to a field where the creek was absent and the water pail was the only way, I felt lonesome.

I shocked for three days on end. Then I was glad to go hauling—wheat, barley and oats. Three teams; one for hauling up the sling-loads in the barn, the others on two wagons keeping one man in the field by choice pitching on—which was the writer.

Hauling in, if you earn your wages plus board, is no exercise for a college graduate. When you contract at top wages and the farmer calls your bluff, you go up at once against an organized scheme operated by experts who are as hard as nails, while you are at first as soft as butter. But that is all a matter of adjustment, enough drinks and enough apples crammed into all your four pants' pockets. There is no time to smoke. You just sling sheaves, crunch apples and count the loads. By schedule you should fork on three loads an hour; which is rather more than you accomplish, though with good luck and not too much hustling after unshocked sheaves you get well over the twenty-load mark for the day; after which with blistered hands—in spite of leather gloves—and tired sore feet, you rouse enough energy not to be missing at supper.

Did I speak of the second joy in life at the creek? Then I will mention the first joy of living—at the farmer's table. You are no angel. You are conscious of a craving within which passes all the foolish craving for liquor, gambling or baseball. The table is heaped with food, which if bought a la carte down town would make a mining magnate blink at the bill. You imagine it will not be enough. Sometimes you are right. Everybody from field way eats as though if he did not he would be hanged. And the joy of such eating is not contained in the English language, except it be in the fat follies of Rabelais. You do not even talk at the table. You simply and solely eat until you can eat no more, knowing that you will never have indigestion, and that four pocketfulls of apples an afternoon make no difference to the total.

When you have raised nine blisters under one pair of leather gloves and eaten as much at one meal as you did at three in town you are either broken in or a fit candidate for the hospital. I heard of one callow youth up in the country who did all the loading from a hay-loader and all the mowing away in the barn—and is not over it yet. But such enthusiasm is a rarity. Good farming will make a man of a derelict from the desk as quick as soldiering. It takes the kinks from his nerves, sluices the poison from his system, stretches all his muscles and limbers up all his joints. When a man's sweat blacks his shirt in a fair wind he is in no need of a masseur. His aches and ailments pack up and sneak back to the town to wait till he gets back. As long as he does the bear dance with the pitch fork or keeps after the three-horse binder shocking he needs no more medicine than a little salve for his sore spots which soon leave him for good. After a week he is limbered up. Age that used to creep on him by stiffening his joints discovers that he has something of the urge of youth again. And he wonders at the fool he was to stay at a sit-down job till he became such a poor soft lump.

Books could be written about this. And the farm folk would never read them. The men I met on that farm—three or four of them—had all been cradled in the kind of work that makes a man hard and supple, and as a rule incapable of fatigue.

The boss has no grown sons. He depends upon hired help. As a rule he tries to keep one man the year around, preferably a married man on the second house on the place, allowing him a garden, a cow, use of a horse, etc., besides wages. In practice he keeps a man about two-thirds of the year with special help in harvest, and while I was there used one of the Government tractors for plowing. By nipping in at every turn, getting ahead of every possible occasion, keeping his machines running as late and early as possible, he is able to keep that 200-acre farm operating normally at a profit. How much profit he does not know—and he has a capable head for management. He keeps no books in the ordinary way. He is not able to turn up a ledger and tell you just what he made last year, and on what he lost and where one part of the place had to carry some other. He believes first of all in hard work, reasonably long hours, extra spurts whenever possible, plenty of help at good wages, and never quarrelling with his men. In this way he keeps his place well manned and does not have to depend mainly on the "bookkeepers and dudes."

What he will make this year he is not able to estimate. I am not sure that he has any sure method of finding out what he makes any year. Very few farmers have. The recent questionnaire of the Financial Minister on the income tax assumes that the average farmer can be a double-entry bookkeeper. Which he emphatically cannot. The average best regulated farm in Ontario is a financial mystery. The Ontario Department of Agriculture seems to have made some attempts at getting at the profit and loss aspect of farming; of which more in our next article. But, generally speaking, the farm is a gamble. Weather, prices and wheat-pits and all the other accidents of nature combine to make it a gamble. The farmer has never learned to consider himself a normal individual. He gets the main part of his living direct from the land. He is surrounded by plenty. He produces for export and what he does not produce he imports. In order to find out what my summer boss amounts to as a going concern I should have to go

"The twist of a glorious creek"

into a lot of matters that are very difficult. The only sure way is for the farmer to sell to himself every bushel and pound he produces at current market rates. Thus he gets the cash value of the raw material. Then he must buy back enough grain and roots and hay to feed and fit his stock. His stock consists of hogs, cattle, sheep, horses and hens. The hogs, cattle, sheep and hens are revenue producers for sale. The horses are laborers. If he sells some of his horses so much the more to his revenue. But the life of a horse is more than a year.

On the credit side he must put labor taxes, food—estimated at current market rates—interest or rent, average annual cost of machinery, losses by death of animals or of breakage, insurance, clothing, harness, doctor bills, church dues, lodge dues, and so on.

You think this is simple. My town friend, it is not so. The Minister of Finance would have the time of his life if he tried to debit and credit and income-tax an average farmer on the premises.

But we must admit that the good average farmer is within reach of more tangible wealth than the average townsman. My boss this summer is within sight of an aggregate of perhaps $4,500 worth of saleable produce outside of what he requires to help him live. How much of that is properly called income as a salary is called income is for the expert to determine. All I know is that while I was on the farm I was handling wealth and was within sight of plenty; that if you should put a Chinese wall about that farmer and keep him from getting out for a year he could manage to live—without tea and sugar and any new clothes and furniture—and still have something left. He would still have a lot of his wheat and oats and hogs and cattle. I know that he is paying off a mortgage and that he has some balance at the bank. I also know that in normal times this farmer, who is considerably above the average, makes some profit on his farm; how much I don't know, but not a great deal. Therefore, the average farmer who is less capable than he is cannot in normal times be more than breaking even, and will do well not to operate at a loss.

This suggests still further what is the matter with farming. If the study of this problem had nothing more in it than how a city man spent a few days of a vacation shocking and pitching, there would be assuredly not much to the matter. I got a better living than I got in town, more health at my work and more entertainment. I had the joy of day after day without telephones or tag-sellers, or somebody with something to sell; of night after night of harvest moons when the only sound to remind me how intent it all was in a sea of starry light was the bleat of a far-off sheep, the clank of a cow-bell, the dropping of apples from the trees and some back-scratching hog playing mandolin on ten rods of woven-wire fence. But if somebody wanted to lend me $10,000 to-morrow to buy and stock a hundred-acre farm and expect me to pay him back out of the profits before either of us were dead I should invite him to apply for lodging at a place where the inmates think all the rest of the world is crazy.—*Courtesy "Canadian Courier."*

Dominion Live Stock Branch

By W. R. Reek, B. S. A., Assistant Commissioner

THE activities of the Live Stock Branch centre around two definite features: (1) The improvement of Canadian livestock, (2) Marketing livestock and livestock products. Organization has been necessary in order to give proper attention to each branch of the industry, consequently the Branch is divided into the following divisions: Cattle, Poultry, Horse, Sheep and Swine and Markets. The divisions maintain men in each province according to the arrangements for assistance and the general need of development work. The promotion and development work in many cases are carried on in close co-operation with the provinces and especially with the District Representatives of the Provincial Departments. The necessity for co-operation which will lead to efficiency and prevent overlapping has long been recognized. Through a careful study of home and foreign conditions, demands, supplies, methods of trade, and possibilities the Branch is consistently carrying out a policy which will, when completely adopted, assist materially in placing Canada in the forefront for marketing quality products.

An appropriation of $1,000,000 has been voted by Parliament.

Cattle Division.

The Cattle Division has been principally concerned in the loaning of pure-bred bulls to specially organized associations in newly settled districts and in backward sections of the older provinces. This work commenced in 1913. Bulls are purchased from individuals or at sales. Our last statement shows that there were 1309 bulls on hand scattered throughout the entire Dominion.

The conservation of useful young breeding stock has been carried on under the Free Freight Policy inaugurated in 1917. In three years 64,881 heifers, 57,221 ewes and 358 sows have been shipped from the stock yards to country points freight free. Such stock has to pass an inspection of the Branch and must not be purchased for speculative purposes.

Many farmers were experiencing difficulty in the purchase of feeding stock and in order to bring them to the stock-yards to purchase and to prevent the slaughter of feeding animals, the Car Lot Policy was put into operation in 1916 in Western Canada and in 1918 in Eastern Canada. Reasonable travelling expenses are paid to bona-fide farmers who wish to purchase animals for feeding purposes only. Up to October 1st, 1920, 68,525 steers, 55,105 heifers and 25,022 sheep had been returned to farmers.

R. O. P. for Cattle.

A staff of 22 men is constantly engaged visiting herds, by request, in order to conduct these semi-official tests. The value of this work is very apparent from the increased interest on the part of the breeders, as there is a tendency on the part of many to enter a larger number of cows annually. Up to the present time 15,960 applications have been accepted and 4,616 certificates have been issued. It is a recognized principle that all sires do not possess, and consequently are not able to pass on qualities of a high order, so far as milk production is concerned. This test is a dependable guide for the selection of sires. It has also been the means of developing and bringing into prominence in the various breeds many families of high producers. One of the big advantages is that it runs over a lactation period.

THE POULTRY DIVISION.

The work of this division is carried on under the following heads: Co-operative marketing, improvement of stock, inspection of eggs, R.O.P. for poultry and market reporting.

The policy for the encouragement of the co-operative marketing of eggs and poultry is being vigorously carried on; it is a stimulant to the industry, it brings the small producer in close touch with the markets and gives him a perspective of the magnitude of the industry and a keen interest in the actual sale of the products. Moreover, through the market activity an opportunity comes for flock improvement work. During 1920 3,000,000 dozen, roughly 200 cars of eggs were marketed co-operatively Quality payment is made possible through such a system. Specialists are constantly at work organizing circles and arranging for shipment under co-operative principles. Through this activity they may then introduce methods for improvement of the flock.

H. S. Arkell M. B . B. S. A.,
Live Stock Commissioner

The average number of eggs laid by Canadian hens is far too low. The quickest way to raise the average is to discard the boarders and then pursue a rational system of breeding and feeding Hundreds of flock culling demonstrations have been given which will enable a reasonably close observer to cull his own flock. The demands for this work are far greater than can be met; producers are encouraged to use purebred cockerels, purchase settings of eggs from reliable flocks or day old chicks when possible.

That all might know where the reliable flocks are, a R. O. P. system for poultry was established in 1919. Breeders of purebred birds enter whatever number they wish and in the first year there were 4,440 entries; in the second year 6,865 and already for 1921-22 one man has entered 1200. Flocks are inspected regularly by competent men and are reported to Ottawa where statistical work is carried on. These flocks, entered from widely scattered areas, form nuclei from which good stock may be secured. Undoubtedly this fills a gap from which the poultry industry has suffered and is a very real advance step in administrative poultry work, there being no system in any other country equivalent to it.

Egg Inspection was commenced in 1919 and covers the shipments of eggs interprovincially in lots of 100 cases or over and for export in lots of 25 cases or over. Last year 334,111 cases were inspected at 965 distinct inspections with the result that 869 were approved and 96 were rejected. 148,668 cases were for export to Great Britain. Canadian eggs were quite satisfactory to British dealers. Voluntary inspections for intra-provincial shipments are also requested, which is ample proof that the trade values the services rendered by the inspectors. Inspection safeguards the interests of buyer and seller alike. The shipper is required to candle and grade the eggs and, when ready for shipment, requests that an inspector be sent. The method employed is to draw at least a 5 per cent. sample from various portions of the lot prepared for shipment and candle and grade them. Inspectors also are required to note the temperature of the room from which the eggs are taken, their condition as to defrosting, sweating, etc., the temperature of car, loading, weather and other agencies affecting shipments of eggs.

The market situation is reviewed from the Central Office and distributed by the Canadian Press. Cables, telegrams and letters are used to gather the world's daily egg situation and by the evening of the same day or the next morning the producer has the world's prices.

HORSE DIVISION.

The main activity has been the organization of clubs which would arrange for the services of a stallion, inspected and approved by the Branch. The idea is to make it possible for the Canadian farmer to use only stallions that are suitable and in this way to build up the quality of the average horse used or offered for sale. A grant amounting to one-third of the service fee is paid annually.

The inspection of foundation Silver Black Fox stock is also carried on looking forward to the establishment of registration as in other breeds of stock.

SHEEP AND SWINE DIVISION.

Formerly Rams and Boars were loaned as are Bulls, but the policy now is applicable in cases of actual need due to hardships which are known and endured by pioneers only. Its application has been curtailed in most places, but in its stead, in order to encourage the use of purebred rams, a premium policy applies; a ten dollar grant is made in two payments to any man who never owned a purebred, provided he purchases one and agrees to care for his flock according to regulations. Any man can secure such premiums but once. 622 applications have been received in two years.

Encouragement is given to the cooperative marketing of wool in every province on principle. This movement has improved the quality of Canadian wools very much, due to proper care, and is assisting very materially in sales. All wool sold co-operatively is graded by the Live Stock Branch; last year this amounted to 4,426,121 lbs.

Dipping, docking and castration demonstrations are carried on in every province. The idea is to produce a better quality of wool, have cleaner, better cared for sheep, and when the lambs are ready for market to ship uniform, well finished and quality animals.

In many districts considerable attention is paid to the securing of purebred rams and through this factor to build up community breeding.

In three provinces we have graded the purebred ram lambs into three classes. The purchasers know where to secure what they require and the breeders learn where their flocks lack. This work is having a great influence upon building up uniformity and improving the general quality. Five provinces may undertake the work next year.

Marketing the product and the returns obtained is the deciding factor regulating the interest of the producer and also the development of the industry. Some parts of Canada are not favorably situated in regard to markets and in order to overcome this co-operative shipping has been established by officers of the Branch. Through this system every producer is paid according to the quality he ships; the stock is loaded in order that they may arrive in the best possible condition. Careful oversight is given but farmers must accompany the shipments to the central markets. Through railway co-operation faster and better service has been given and still better is promised. The farmer receives all his stock is worth on the open market and in addition he learns much about the business, where the weak spots are in his own business and also controls his output one step farther along the road toward the consumer.

Boys' and Girls' Clubs.

Perhaps the greatest power for the uplift and development of Canadian agriculture lies in the boys and girls; not for one moment should this power be exploited to the detriment of the boys and girls, but they should be given an opportunity to see agriculture in the proper perspective. The organization of Boys' and Girls' Clubs will not only give them a knowledge of agriculture, but is recognized to carry valuable educational features also. Many Provinces have clubs organized and have maintained them successfully for years. This Branch is prepared to carry this work one step further and project into it the marketing feature which will enable the boy to raise and then dispose of his animals under the most favorable of circumstances. The Pig Clubs have been started in a small way. This is co-operative work between the Branch and Provincial Departments.

Educational exhibits are staged at all the larger shows and at as many as possible of the others throughout Canada. These are prepared to illustrate definite features bearing on the marketing problems of the day.

Grants are made to exhibitions under definite regulations. Such grants are supposed to supplement the prizes offered by the exhibitions for purebred stock. Judges are supplied to those exhibitions where grants are paid.

The administration of the Live Stock Pedigree Act requires considerable time and careful attention.

Markets.

The marketing of a nation's livestock and livestock products is not only a large undertaking but an intricate one; this operation was in the past, so far as the producers were concerned, shrouded in partial mystery—they knew very little about it and their opportunities for acquiring information were so few that practically nothing was known definitely by the average man. However, this situation is rapidly improving, the seller and the buyer are coming to know one another and the exchange of ideas re difficulties and actual knowledge acquired by both are tending to break down many of the old misunderstandings.

The Government under the Live Stock and Live Stock Products Act has supervision over the Live Stock Yards and agents are employed whose duty is to assist in bringing about conditions on the yards as was intended by those who drafted the yard regulations applying under the Act; this activity principally is with the Live Stock Exchanges. Actual enforcement of rules also requires considerable time. Time is an essential factor in dealing with all livestock conditions either on the yards or in the country.

Organization and reorganization of Exchanges have been carried out with by-laws approved by the Minister. The yards are supervised as to construction, equipment and operation. All charges have to be approved by the Minister.

Livestock is graded according to quality and the results compiled at Ottawa. The origin of the stock is noted and the Branch is now able to report the number and grade of the various classes shipped from any point in Canada to a public stockyard.

Market reports are prepared daily by the agents on the yards, are given to the local press and sent over the Associated Press for use of all those connected with the news service. In this way an independent and unbiased report is delivered through the regular news channels.

Much relative market data is gathered and compiled for the use of the public.

The principal ideas underlying the market activities are: (1) To supply the producer with the latest news regarding prices and values. (2) To ensure him in so far as possible an open competitive market upon which his livestock may be sold. (3) To supply definite information about the world situation. (4) To assist farmer purchasers on the yards and to encourage the conservation of breeding stock, the proper finishing and the elimination of waste.

The marketing is of vital interest; the Branch is organized in order to supply a regular intelligence service, to assist in organization wherever necessary and to co-operate with any agency that has as its object the betterment of the industry.

A Survey of Our Forests From the Air

By J. M. Swaine, Chief, Division of Forest Insects

THROUGH the co-operation of the Air Board, the Commission of Conservation and the Entomological Branch, an interesting experiment in aerial forest reconnaissance was conducted last summer over the country north and west of Lake Timiskaming in northern Ontario. The Air Board furnished a Curtiss flying boat, type F.3, with a wing spread of 78 feet, and equipped with a 360-h.p. Liberty engine. In addition to the pilot the machine carried two observers.

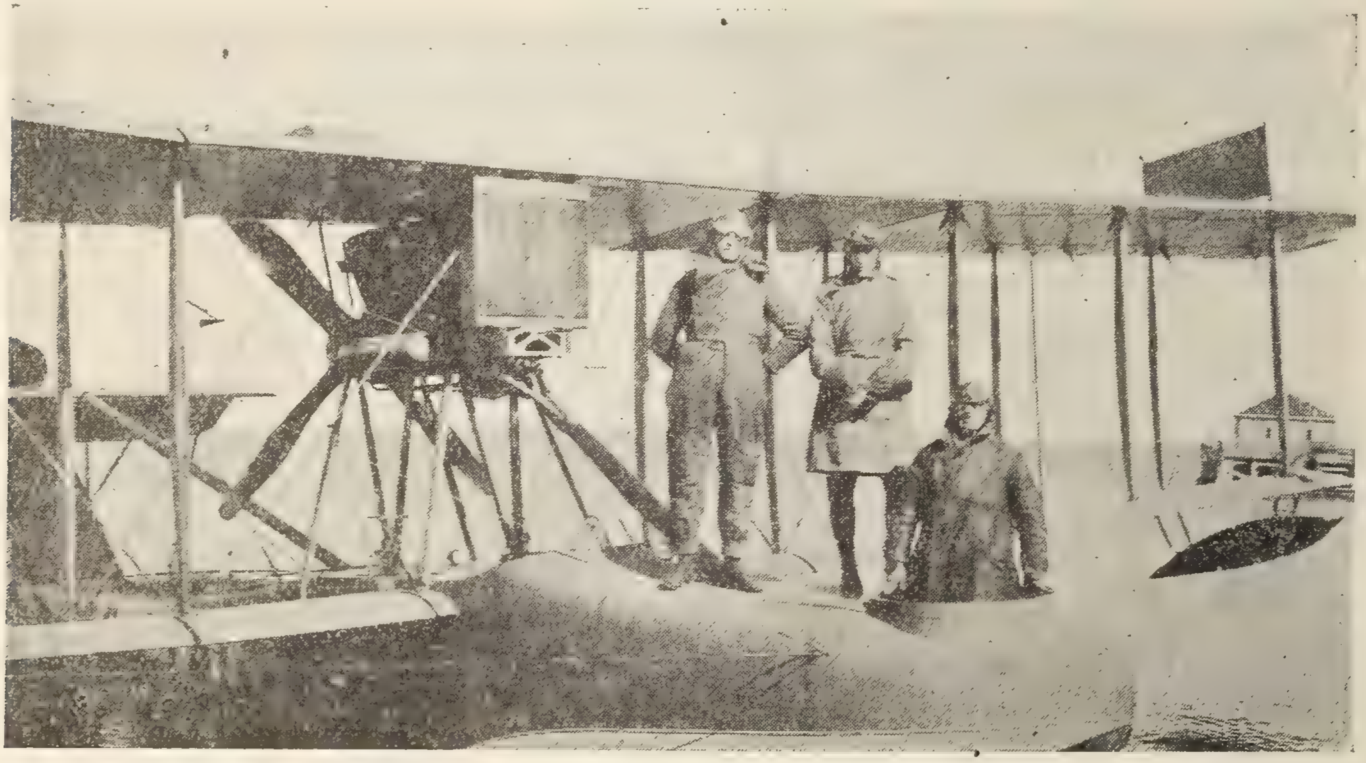
Colonel Robert Leckie, D.S.O., M.C., D.F.C., piloted the machine from Ottawa to Haileybury, with Mr. Clyde Leavitt, Chief Forester of the Commission of Conservation, and the writer as passengers. The trip by way of Mattawa and North Bay, covering 336 miles, was made in five hours' flying time. Colonel Leckie had to return to Ottawa for his trans-Atlantic flight, and left Captain P. Wickens, A.F.C., as pilot. Later, Captain C McEwen, M.C., D.F.C., relieved Captain Wickens.

Messrs. R. D. Craig and S H. Edgecombe conducted the forest reconnaissance for the Commission of Conservation, and the writer and Mr. M. B. Dunn that for the Forest Division of Insects of the Entomological Branch.

In connection with their survey of the forest resources of Ontario Messrs. Craig and Edgecombe determined the feasibility of aircraft work for the special investigation they were conducting. In four days' flying they mapped in the main timber types, such as conifers, hardwoods and mixed forests, recent burns, muskegs and clearings in approximately 1,800 square miles of the region around Temagami Lake. At an altitude of 3,500 feet it was possible to distinguish the more conspicuous species of trees, and together with a limited amount of ground work in the various types, to secure a comprehensive knowledge of the forest conditions on a large area in a very short time. Three weeks were spent in the aerial survey about lake Timiskaming, and it is estimated that to obtain the same amount of information by ground survey it would have taken two men at least eight months.

The officers of the Division of Forest Insects of the Entomological Branch studied an extensive spruce budworm outbreak spreading through the northern pulpwood forests from northern Quebec across the interprovincial boundary into Ontario. A strip of country more than 100 miles long and 25 miles wide had been freshly infested during the last two summers and the injury was spreading westward. It was very important to determine the area covered by the outbreak last summer and to obtain definite data upon the rate and direction in which the injury was spreading.

A ground survey party attempted to obtain the information we required, but it was impossible to cover the whole area in that manner before winter. The spruce budworm outbreak spreads only in spruce and balsam. Much of the Temagami country carries strips of hardwoods with pine along the water courses, and since the latter offers the only available route for a rapid survey, it is evident that a ground party must have difficulty even in locating the balsam and spruce stands. There is the added drawback that the party cannot foretell how far or in which direction it must travel to reach the boundaries of the infestation, and it is, therefore, difficult to outfit properly. The possibilities of an air survey appealed to us strongly, and the results were even beyond our expectations. From a height of 3,500 feet it was possible to determine the different types of timber and to locate the blocks of spruce and balsam accurately. The budworm-infested trees are reddish or yellowish in colour, and from the air they were easily distinguished and the area of infestation could be readily de-



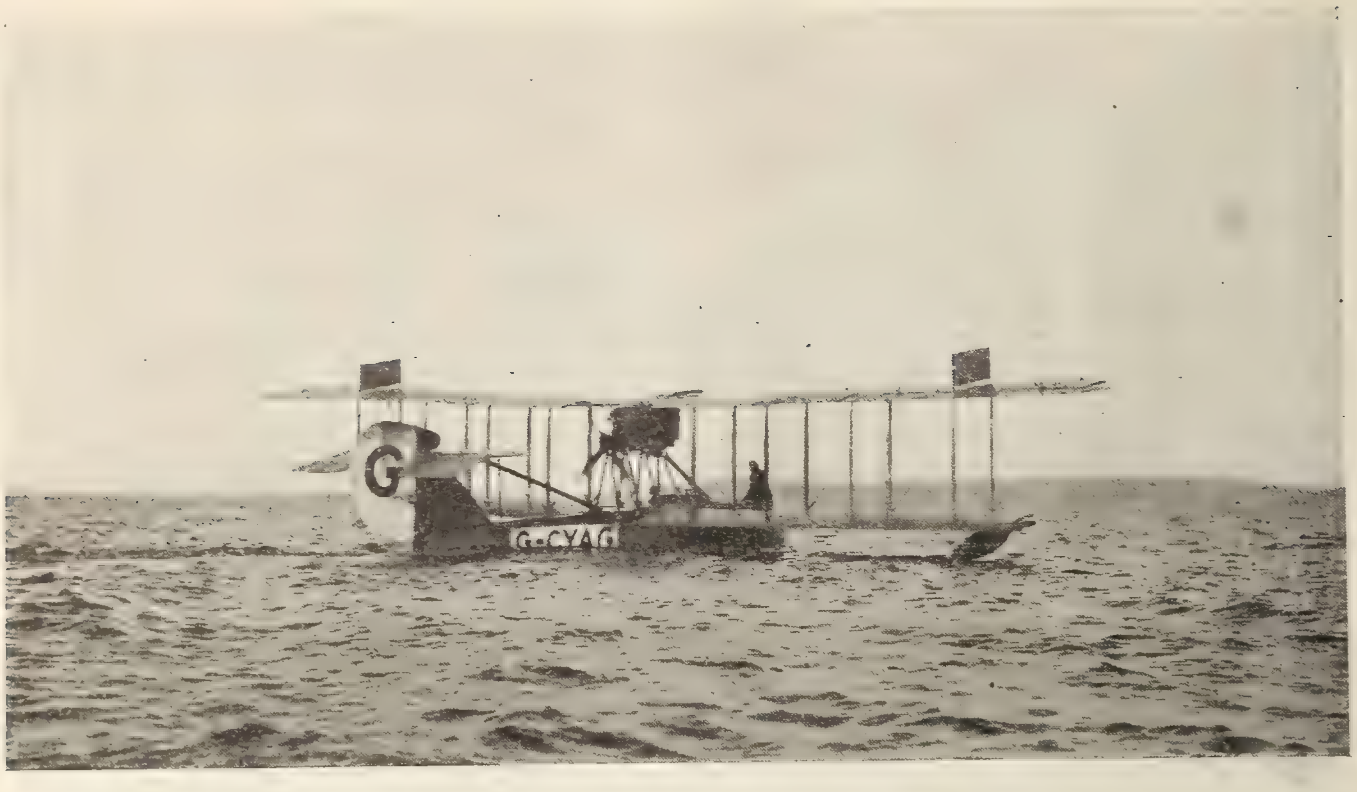
Type of Flying Boat used in Forest Survey termined. The information thus easily obtained through a few days' flying would have taken two men more than six months to acquire by hard work by ground surveys.

The view from the air enables us to determine only the area attacked, and with some accuracy, the severity of the infestation. It is necessary to supplement this work by short ground surveys then easily planned and to study minutely the nature and effect of the injury.

It is not possible yet to foretell how far west this budworm infestation will spread, but it will probably reach the Great Lakes within the next few years. It has apparently not yet affected the black spruce forest north of the height of land. If these air surveys can be continued each summer we can determine exactly, by a few flights during midsummer the boundaries and rate of progress of the infestation, and this information will aid the limit holders to salvage their timber in time.

It is apparently impossible to check the spread of this outbreak through any practical artificial means yet known to us. The young caterpillars are hibernating in countless myriads on the twigs of balsam and spruce over an area more than 100 miles long and 25 to 50 miles wide. To prevent the spread of the injury it would be necessary to destroy the majority of these caterpillars, and this could only be effected by artificially burning the spruce and balsam over all this area, a proposal that is, of course, unthinkable. Adverse weather conditions, combined with parasites, may occur to control the outbreak in time to save most of the timber, or, lacking these natural control factors, it may sweep onward like a great fire and die out only through lack of food material.

Forest in the Temagami Region, Northern Ontario, as seen from a height of 3,500 feet



On Lake Temiskaming, Northern Ontario

Lightning Protection

The Importance of Good Groundings

By R. C. Moffatt, M. A., Lecturer in Physics.

HUNDREDS of thousands of dollars worth of property and produce are yearly destroyed by lightning. In the United States it is estimated that about 1,500 people are annually affected by lightning stroke. Much of the loss and hazard can be prevented by the use of lightning rods which are now recognized to be about 99 per cent. efficient for isolated farm buildings. It is also considered that they reduce the lightning hazard by from 80 to 90 per cent. on houses where the probability of personal danger is believed to be about 50 per cent. when struck.

The defect in any so-called properly installed system may be either in the points, the conductor itself, or the groundings. The latter is by far the most vital part of any system, and is seldom given the attention it demands. The most perfect rod loses much of its efficiency by the presence of a faulty grounding. The purchaser and the agent should, therefore, see to it that they have installed the most efficient grounding possible under the conditions. The purchaser, as a rule, lacks sufficient knowledge of electrical phenomena to act as judge, and therefore it should rest with the agent and through him with the company he represents to safeguard the farmer in this as well as every other respect.

The relative importance of the rod itself and the grounding can easily be shown. Consider a barn rodded with 100 feet of half-inch continuous copper rod with one point in the middle and two groundings. The resistance to steady currents is only .00137 ohms, and to high frequency currents, such as 100,000 cycles, is approximately .02 ohms. The resistance in the groundings may run anywhere from 15 to 100 ohms, or even more. Assuming a maximum current in a discharge to be 25,000 amperes, then from Ohm's Law the fall of potential between the point and the groundings would be only 500 volts, while over the grounding with a resistance of 15 ohms it would be 375,000 volts. Since the sparking potential is 30,000 volts per centimetre, the resistance in the rod alone could only produce a side-flash of 1-60 centimetre, while that of the groundings would produce one about 12.5 centimetres, or 5 inches. It is quite evident then that the resistance of the rod itself is quite negligible when compared with that of the ground connection.

The best possible grounding is to connect the rod to an extensive underground water-pipe system if obtainable. Many companies have, in the past, sold patented grounding devices which were more a source of revenue to the manufacturer than of service to the purchaser. This practice, fortunately, has now become more or less a thing of the past.

In England and the United States two types of groundings have been recommended, namely, the "plate" and the "pipe" system. The former consists of a copper plate not less than 3 square feet in area and 1-8 inches thick buried in powdered charcoal or coke to which the rod is riveted and soldered. In the latter the rod is soldered to a cast or galvanized iron pipe driven into the ground to permanent moisture. It is found that using 180 square feet of the plate grounding gives a resistance of 15 ohms.

Increasing the size of the grounding does not proportionately reduce the resistance since doubling the size of the pipe only reduces the resistance from 6 to 12 per cent. Increasing the number of groundings does, however, reduce the resistance since using two parallel groundings instead of one will from the laws of resistance reduce the ground resistances by 50 per cent. provided these groundings are 6 feet or more apart. Thus increasing the number of parallel paths to earth will materially increase the efficiency of the system.

All groundings should be sunk to permanent moisture, which in ordinary soil exists about 6 to 10 feet below the surface. Lowering the grounding below the uppermost stratum of permanent moisture is quite unnecessary as it is in this layer that the induced and neutralizing charge resides.

When the soil is shallow and the rock rises above the layer of permanent moisture, special systems must be used. In such cases it formerly was advocated to run the rod into a nearby well, which frequently results in a very poor grounding although the actual ohmic resistance may be only 2 or 3 ohms. In such cases the neutralizing charge would have to travel from the upper stratum of permanent moisture to the lower end of the rod in direct opposition to the force producing it which is impossible. If a discharge does occur, the charge on reaching the end of the rod would have to make a turn of 180 degrees to reach that layer.. This also is contrary to the action of such discharges. The result is the electricity is "choked off" and a discharge takes place between the rod and this layer by the easiest path which may be via some inflammable material. This is particularly true of windmills built on barns. The iron shaft is allowed to act as the conductor and the water in the well as the grounding which frequently results in the charge leaving the rod and going to stanchions, or other materials in the barn, often causing fire. In such cases the shaft should be connected to the main conductor or grounded separately in some approved manner, preferably the first and at the ridge of the barn.

For rock groundings the best method is to dig a trench completely encircling the building and lay on the rock a continuous strip of the copper rod to which the conductor on the barn is electrically connected. Additional radial strips from that encircling the barn may be used if desired. This method may allow sufficient earth charge to leak off to neutralize the cloud, or if a discharge occurs conduct it to the earth with the least possible danger to the building.

It has been seen that the grounding is a very important factor in lightning protection, and upon it a large part of the efficiency of a system depends. The resistance of the total groundings should be reduced as low as possible, consistent with cost, and should be below 15 ohms at least. This can best be accomplished by using several widely separated groundings made of the regular rod instead of the large copper plate.

A Morning Promenade

By B. A. Ward, '23.

"SPIKE!"

We were deep in the heart of a wonderful dream — shredded wheat, cream, sliced banana, an appetite and lots of time—when Top located us. His arrival banished our dream—but not our appetite—and we awoke at two a.m. of a delightful February morning to find ourself being presented with a Special Despatch and a lot of advice. We accepted the despatch—without thanks—and prepared ourself for the journey.

The trip we had to make at this unearthly hour was to an abandoned farmhouse located some few hundred yards to the rear of our left sector. By "abandoned" we mean a dwelling from which the civilian element has been eradicated by some means other than the application of lime sulphur or bordeaux. Monsieur had been convicted of espionage early in the war; Madame, deeming discretion the better part of a bad job, donned her widow's weeds, bade farewell to the dear old homestead, and established, soon after, a "magazin de pommes de terre fritter" in the thriving village of Mont des Cats.

The homestead, known to Geographia Ltd. as Siege Farm, had never been heavily shelled, and the rooms on the ground floor and the capacious cellars and outbuildings were occasionally occupied by troops in support. The special despatch 'twas our privilege to deliver on the morning in question was addressed to the officer in charge of this historic pile, and even before we donned our robe of sackcloth and rubber, instinct, or something else, told us that our trip would be eventful. Our memory reminds us that we were not disappointed.

The night, of course, was dark and stormy, as were most nights at that season in Belgium, but for a short while after we had left the billet and were following the roadway, the rain hesitated somewhat and the sky cleared a little, as though to afford us a little encouragement. All the hopes raised in our bosom by such phenomena, however, were doomed to disappointment. No sooner had we left the stone surface of the roadway for the muddiness of the fields than the clouds rolled together and the rain fell in torrents. The darkness was intense and only when a flare was fired was it possible to see one's hand before one's face.

Army waterproofs were seldom of any value during wet weather, and under such conditions as these the one which we carried was worse than useless. In a very short time our tunic was saturated and a young stream was coursing down the small of our back—a most delightful sensation. The only portion of us dry was the interior of our steel helmet.

In the field through which we were endeavouring to navigate only one obstacle of moment presented itself—a stream some fifteen feet in width. In daylight a fallen tree trunk did service as a bridge and the passage was fairly simple, but at night the darkness and the treacherous footing were very likely to cause one more than a little excitement. Our progress through the mud was, naturally enough, fairly slow, but at last by careful manoeuvering, we succeeded in reaching the bank of the stream, where we paused long enough to get our bearings and light a cigarette.

Fortunately the bottom of the stream wasn't very far down, so we knew it would be possible to wade across. The cobbles and stones there, however, thanks to the Algae—we didn't know its name then— were unpleasantly slippery and treacherous. The darkness rendered "watching our step" impossible, so 'twas very necessary to "gang aisy'" and "keep to the right." These valuable injunctions we observed as faithfully as we knew how and succeeded in reaching the shallower waters near the far bank without sustaining any injuries more serious than a bruised shin. Here, considering ourself safely across Jordan, we neglected to observe the same amount of caution we had deemed necessary in midstream. 'Twas most unfortunate! Without a moment's warning our feet slid from beneath us and with an ear-piercing shriek we plunged face downward into the tide.

Trying to visualize what had occurred,

when we finally gained the safety of the shore was by no means easy. Circumstantial evidence in the form of wet sleeves led us to conclude that in falling we had put out our hands to save ourself. Our steel helmet being wet both inside and out indicated quite correctly that it had also toppled. In addition to these "signs" a nasty taste and a most uncomfortable sensation gave us a fairly good idea of where to seek our cigarette if we wished to locate it. From the wet condition of our features we judged our rubber sheet had endeavoured to follow our tin hat. Unfortunately it had been restrained by the safety pin—or nail—at our throat.

After breathing a few prayers of gratitude for our deliverance from so unromantic an end, we recommenced our voyage—not feeling altogether as genial as if on leave but well able to appreciate the fact that things could be worse, though not much. In a short time we gained the highway, from which we had an unobstructed view of a portion of our sector, and as our path was now more easily followed, we had a few minutes in which to allow our thoughts to wander. Watching the flares drop into No Man's Land and burn themselves out among the entanglements is quite an interesting experience, but a scene to which distance lends enchantment. We found ourself hoping, among other things, that no friend of ours would be unfortunate enough to locate where one of those "beautiful" flares wished to settle because—well! it's a painful subject!

By the time we had indulged in these and a few similar soliloquies we had left the highway and were endeavouring, with the help of the odd flare, to locate the pathway which we knew should be somewhere nearby. Quite a large portion of the field before us had been planted with barbed wire, and as the plots were liable to be found anywhere it was essential that one locate the path if he wished to get through with a minimum of trouble. The rain had practically ceased but the darkness was as dark as ever and we knew our progress would be slow even when we found the path. After falling into every shell hole within range we found our objective and straightway began the difficult task of following an ill-marked track on an ill-lighted morning. Our progress even in the clear was slow and when we neared where we knew some of the entanglements should be, it degenerated to a crawl. Only when a flare fluttered did we dare increase our speed. After what seemed like hours of this nightmare travel, we reached what appeared to be a parting of the ways. Tracks led off in every direction and although we knew our way well enough in daylight, we were unwilling to rush in too foolishly Incidentally we didn't feel painfully angelic. The fact that plots of wire seemed to have been planted all around us was a further deterrent from too hasty decision. Our only safe move, therefore, was to stand still and await further illumination from the line. In a few minutes a nervous Allemagne obliged us and we decided to take full advantage of it. A sad mistake! Barely had we taken a dozen paces than the light flickered and vanished and ere we realized our fearful predicament we found ourself waist deep in the thickest plot of wire in Belgium. We had no idea that the countryside held as much wire as seemed to be hemming us in and the prospect of extricating ourself in one piece seemed hopeless. We could picture our corpse being rescued by some gallant Lance Corporal when daylight approached and the prospect of being the medium whereby he might gain a decoration was everything but pleasant. Until that moment we had never realized just how awful war really could be.

At first we tried standing still as our struggles seemed to result in our tying ourself all the more tightly, but 'twas no go at all. It gave the barbs all too ample opportunity to locate the most tender spots in our person, of which despite some thousands of route marches, we still had a few. The barbs found them all.

It is possible that some mental telepathy was at work as we wrestled with those barbs. Whatever the cause Fritz was feeling nervous and his flares began to flutter "in rich profusion" as a certain O.A.C. lecturer would say. The illumination shed by these gave us some idea of the direction to take in extricating ourself. Slowly and painfully we made our way out, the barbs assisting us all too frequently. Many of them were loth to see us go and clung frantically for as long as they were able. Some, alas, were souvenir fiends and these snatched portions of our raiment and person as we passed, which expressions of regard we failed to appreciate.

In our next attempt to locate the passage we were more successful, and a break in the clouds a little later showed us that we had safely "crossed the bar" in that field, also that dawn was rapidly approaching. Our troubles were now practically over and in a few minutes we had reached the shelter of the farm buildings.

Stopping only long enough to satisfy ourself that our despatch was safe and our hat on straight, we passed through the barnyard—narrowly escaping serious injury from falling into an overturned honey-wagon—and entered the front door. The interior was in complete darkness—as any house should be at such an hour—and as we moved cautiously down the hall we wondered what would happen next, but were too fed up to care. Soon we reached a door, which we opened. It led to a small room, the window of which faced the line. The window was heavily boarded up but through the cracks the flares were intermittently shining. In one corner of the room was a dark object which we took to be a bed. A healthy snore emanating from the spot told the world at large that it was a bed and furthermore, was occupied. With fast beating heart, therefore, we made our way toward the noise, hoping that here at last was our prey. With one of our few remaining matches we lit a candle and a cigarette, both of which we found upon the table, and in a few puffs felt almost at peace with the world.

Wakening our friend was not easy. When he finally came to and we asked him who he was he apologized and said he didn't know definitely. Possibly our bedraggled appearance was responsible for his lapse of memory and timidity. He seemed capable only of staring. To assist him somewhat, if possible, we enquired if he was Captain Spaghetti, the officer in charge of the buildings, but he didn't think so. "In fact," he added, throwing off his lethargy and coming to life in earnest, "I'm sure of it. Romeo lives across the hall!" Our heart sank into the mud around our feet and we began to fear our despatch, which we fondly hoped would win the war for us before next spring, would never be delivered. We dared not speak, so we blew out the candle, borrowed a flashlight and some cigarettes from the table and rambled across the hall.

Locating our prey was now comparatively easy as he was alone in the room we entered. In a few minutes he was sitting up in bed, blinking in the light of the candle we had lit, and, from the expression on his face, in a most disgusted and curious frame of mind. We presumed he was wondering where he had seen anything like us before but did not enquire. He finally gave it up and turned his attention to the despatch we handed him.

'Twas customary to await any reply which might be forthcoming so we deposited ourself in a most attractively upholstered armchair which we have reason to believe had previously decorated the drawing-room of the chateau near by. In a few minutes we should have been as fast asleep as our friend across the hall, but that was not to be. Spaghetti was speaking and never has mortal voice sounded so sweet and soothing to our weary soul. We loved it on the spot. "Would you care for a little stimulant?" it queried. We weren't accustomed to indulgences between meals, but we thought possibly a little liqueur might help us on our way home, and we had a long way to go. On partially regaining our breath we endeavoured to express our thanks but were not wholly successful. He understood, however. "Did you bring this from Brigade?" he asked. We wanted to say "Yes" but had to content ourself with a nod. He then enquired if we knew what it contained, but a wag of our head had to suffice for a negative reply. Passing it across to us, he remarked, in a tragic voice, "Read it and weep." We did both.

Our Special Despatch read as follows:

To the Officer in Charge of Siege Farm Defences.

A Banquet in honour of Gen'l Wampus, D.S.O., C.M.G., recently gazetted to the command of this Division, will be held at Corps Headquarters, Q-25-r-34, tomorrow evening, February 13, 1915.

Please endeavour to attend.

(Signed) B. GOOD,
Bde. Major.

Chats About Great Musicians

By H. C. Fricker, '23.

I. Felix Mendelssohn---Bartholdy.

"Never, perhaps could any man be found in whose life there were so few things to conceal and regret."

THE LIVES of great men are always interesting to those of us who appreciate greatness. They present a two-fold attraction,—the unusual gifts with which Nature has endowed the genius, and his method of using them. Success depends, we find, almost entirely upon this manipulation of hereditary talent, for many a man of distinguished capabilities has failed on account of his inability to develop and apply his originality.

There is no better example of a well-ordered and systematic grasp of power than in the life of Mendelssohn, a name familiar to everyone who has made even the smallest acquaintance of music. Who has not heard of his "Wedding March," "Spring Song," "Songs Without Words," "A Midsummer Night's Dream," "Overture," and the oratorio, "Elijah"? Born at Hamburg on Friday, February 3, 1809, he showed at the early age of twelve powers of composition which stamped him as one of the greatest creative geniuses the musical world has ever known. At thirteen he began to practice extempore playing, the art of working out on the piano original developments of a theme either borrowed from a worthy composer, or of his own invention. Great was the surprise of Goethe, we are told, when the young genius, forgetting part of a Bach Fugue he was playing for the great German poet, developed the composition himself at great length,—a flash of audacity in which the mature Mendelssohn would not have dared to indulge.

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"My cousin, John Edward Taylor, was staying with us at the time. He had composed an imitation Welsh Air, and he was, before breakfast, playing this over, all unconscious that Mr. Mendelssohn, (whose bedroom was next to the drawing room), was hearing every note. That night when we had music as usual, Mr. Mendelssohn sat down to play. After an elegant prelude, and with all possible advantage, John Edward heard his poor little air introduced as the subject of the evening. And having dwelt on it, and adorned it in every graceful manner, Mendelssohn, in his pretty, playful way, bowing to the composer, gave all the praise to him."

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The careful self-development of the young musician can be traced to his early childhood. His mother was very strict in her methods of education. Yet she was deeply beloved by her children to the end. Felix remarked in later life that "they enjoyed Sundays so much, because they were not forced to get up at 5 o'clock and work." His father, Abraham, a notable banker, and the son of Moses Mendelssohn, termed the "Modern Plato" in literary circles, was a careful and wise parent, who, never over-proud of his son, was rather anxious for fear that his future would not be worthy of his youthful accomplishments.

Care and thoroughness were essential to Felix. In sketching, letter writing, billiards, chess, riding, gymnastics, swimming and dancing, he showed the excellence and ardour so thoroughly characteristic of his music. Yet it was his business-like method of doing one thing at a time, and that thoroughly, which enabled him to write the vast amount that he did. Before he was twenty-one he had completed numerous songs, quartettes, piano and violin sonatas, an orchestral symphony, a comic opera, the concert-overture to "A Midsummer Night's Dream," and various other piano, string and organ works.

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"We observed how naturally objects seemed to suggest music to him. There was in my sister Honora's garden, a pretty creeping plant, new at that time, covered with little trumpet-like flowers. He was struck with it, and played for her the music which (he said) the fairies might play on those trumpets. When he wrote out the piece(called a Capriccio in E Minor) he drew a little branch of that flower all up the margin of the paper."

. . . . . .

His methods of composition showed the natural and at the same time remarkable working of his mind. A melody having suggested itself, he would think it out in detail, adding harmony and all themal development, until he had memorized the finished article. Then and then only would he put it down on paper, in a style as neat and beautiful as was his personality.

Nature appealed to him very strongly. In Switzerland and Italy his impressions were full of enthusiasm and deep appreciation. "I remembered the mountains before only as huge peaks," he wrote. "It was their height that formerly took possession of me. Now it was their boundless extent that I particularly felt, their huge broad masses, the close connection of all these enormous fortresses, which seemed to be crowding together and stretching out their hands to each other. Then, too, recollect that every glacier, every snowy plateau, every rocky summit was dazzling with light and glory, and the more distant summits of the further ranges seemed to stretch over and peer in upon us. I believe that such are the thoughts of God." And again—"The mountains are acknowledged to be the finest after rain and today looked as if they had just burst the shell."

His love story is particularly fascinating. Felix met Cecile Charlotte Sophie Jeanerand in Frankfurt when he was twenty-seven. Cecile was just seventeen. Finding himself deeply attracted by her, he left the city for a month, to "test his affections." His own words prove how true were his feelings. "When away from her I am always sad. . . I owe her the first real happiness I have had this year." And when they had been married only four months:—"Think of me who must in a few weeks leave Cecile and go to England,—all too for the sake of a Musical Festival. Gracious me! All this is no joke. But possibly the death of the King of England will intervene and put a stop to the whole project." His wife's calm composure at his death, showed her gentle and dignified disposition at its best. Devrient, a family friend, says of her: "She received me with the tenderness of a sister, and wept in silence. She was most unpretentious in her sorrow, gentle and resigned to live for the care and education of her children. There could not be a more worthy memory of him than the well-balanced, strong and tender heart of this mourning widow."

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A few of the more important events of Mendelssohn's most varied career may be of some interest. The piano he learnt with his sister Fanny who was four years his senior. Together at the age of seven and eleven, the two children studied under Madame Bigot, a very successful pianist, in Paris, where their father was called on business. On returning to Berlin, Felix studied general subjects under Heyse, piano with Ludwig Berger, composition with Zetter, while Henning taught him the violin, and Rosel landscape. Greek he learnt with his younger sister Rebecca. In the summer of 1822 when Felix was thirteen, had played in public, and was composing regularly, the family visited Switzerland. During the next few years he became intimately acquainted with Moscheles, known as the Prince of Pianists, who became a frequent visitor to the Mendelssohn home, especially on

Sunday evenings, when musical parties were held regularly. It was on these occasions that Felix had the opportunity not only of hearing his own compositions, but of conducting and playing before an audience of talented musicians. A visit to Paris; a tour to Baden-Baden and Frankfurt; the formation of a choir of sixteen voices and the study of Bach's Passion, (a performance was given with great success a year later); the visit to England at the age of twenty, Mendelssohn's appearance at the Philharmonic concert, where he was given a warm reception; all these events followed in quick succession. Edinborough, Liverpool, Ireland, Chester, were visited, Felix composing steadily all the time. Italy saw him next, after which Munich, Paris, London, and Berlin. In 1833 he took charge of the musical activities in Dusseldorf, and revolutionized both church and theatre music in vogue there. He was married in 1837 in Frankfurt, and devoted the next few years of his life to the Gewandhaus Concerts at Leipsig. From this period onwards he conducted concerts in Dusseldorf, Leipsig, Dresden and Birmingham, was appointed Kappelmeister to the King of Saxony formed a Conservatorium at Leipsig, and played before the Queen and Prince Albert at Buckingham Palace. But in 1847, his sister Fanny died, and the shock was so great that Mendelssohn suffered a severe nervous breakdown. On November 4th, of the same year, he died. Letters of sympathy were addressed to his wife from all over Europe, the most notable being from the Queen of England and the Kings of Prussia and Saxony.

Possibly the most touching tribute to his memory is to be found in the words of Mrs. Austin, one of his English admirers:—"Much as I admired him as an artist," she wrote, "I was no less struck by his childlike simplicity and sportiveness, his deference to age, his readiness to bend his genius to give pleasure to the humble and ignorant; the vivacity and fervour of his admiration for everything good and great, his cultivated intellect, refined tastes and noble sentiments."

Mendelssohn has left us a wealth of music of a quality that will never become out of date. But he has done more. He has shown us the soul of a man who lived his life to the full, made the utmost of his talents, and found the secret of happiness. He never knew despair, he was never morbid, he never ceased to develop the power of life within him. And who shall say that the heritage of thoughts and example which he gave to the world cannot mean as much to us nowadays as it did to his success and the pleasure of all who knew him?

* * *

"It requres more thought, keener judgment and closer application to be a successful farmer than to succeed in any other calling."

"Butchers count by weight, but knights by courage."

"To-day is the tomorrow you worried about yesterday."

I know precisely that for either object, whether to bring the weeds and quitch grass to the surface and to wither them by scorching heat, or to expose the earth itself to the sun's baking rays, there can be nothing better than to plow the soil up with a pair of oxen during mid-day in summer.—Xenophon, *The Economist,* 434-355, B. C.

The Dairy and Cold Storage Branch

By J. A Ruddick, Commissioner.

Origin and Development.

DELEGATES from the Dairymen's Associations in the several provinces assembled in Ottawa on April 9, 1889, and petitioned the Government to appoint a Dairy Commissioner for the Dominion. The suggestion was favourably received and the result was that Prof. Jas. W. Robertson was appointed to the position on February 1, 1890, and Mr. J. C. Chapais as Assistant Dairy Commissioner with headquarters in the Province of Quebec. Prof. Robertson was at the same time appointed Agriculturist to the Experimental Farms, and continued to hold the dual position until December, 1895, when he was relieved of his duties as Agriculturist and devoted his whole time to the Dairy Branch as Agricultural and Dairy Commissioner.

The work of the Branch was developed and expanded until in 1901 divisions had been created for Dairying, Live Stock, Cold Storage, Extension of Markets, Fruit, Seed, and Poultry. When Prof. Robertson resigned on January 1, 1905, a reorganization took place by which the Live Stock and Poultry Divisions became the Live Stock Branch, and the Seed Division was also raised to the status of a Branch, leaving as the Dairy Branch the Divisions of Dairying, Fruit, Extension of Markets, and Cold Storage, under a Dairy Commissioner whose title was changed a year later to that of Dairy and Cold Storage Commissioner.

On April 1, 1914, the Fruit Division was made a separate Branch, leaving the Dairy Branch with its present Administrative, Dairying, Extension of Markets, and Cold Storage Divisions.

Administrative Division.

This Division has, of course, the general direction of all the activities of the Branch and the organization of new lines of work. The general progress of the dairying industry, new processes and developments throughout the world, as well as general market conditions for dairy produce, are studied, with a view to their effect on Canadian conditions, while the Administrative Division also keeps in touch with the Provincial Departments of Agriculture to preserve the proper correlation and co-operation of the work of the Federal and provincial departments in matters connected with dairying.

Dairy Division

During the early years of the existence of the Branch the Dairy Division took an active part in establishing the manufacture of cheese in Prince Edward Island, operating a number of factories for several years. Another piece of pioneer work was the establishment of creameries in the Northwest Territories. The creameries were erected by local co-operative societies and operated by the Branch until the creation of the new provinces of Saskatchewan and Alberta, when the work was turned over to the provincial departments. Another line of work was the inauguration of winter creameries, which were operated as dairy stations at several points in Ontario and other provinces. Until this demonstration was undertaken there was no creamery butter manufactured in Canada during the winter months.

In 1902 a campaign was started with the object of improving the quality of Canadian cheese through the control of the temperature in the curing rooms.

The Commissioner was authorized to erect and operate for a period of five years, four model curing rooms at different points in Ontario and Quebec for the purpose of demonstrating the value of this improvement.

The data secured through the operation of these curing rooms showed that the quality of the cheese was greatly improved, and that there was a sufficient saving in the shrinkage of the cheese by being cured at a lower temperature to meet the cost of making the improvements in the curing rooms. Briefly, the demonstration was so conclusive that no cheese factory is now considered to be fully equipped without some means of controlling the temperature in the curing room, and "cool cured" cheese is quoted at a premium on the market.

During the years 1908-9 a thorough investigation was made of the methods followed on the farms in caring for milk which was intended for the manufacture of cheese. It was found that the practice then in vogue was not only useless, but in many circumstances positively harmful. As a result of the investigation the Division was able to recommend an effective treatment which required less labour and apparatus. The presentation of the case was so conclusive that the care of milk for cheese making was revolutionized in a single season and the quality of the cheese improved as a result.

At the present time the only Dairy Station in operation is located at Finch, Ont., where a combined butter and cheese factory was built in 1912. The objects aimed at in establishing this station were to provide facilities that would enable the Dairy Branch to

(a) control and operate a model combined cheese factory, creamery and milk and cream shipping station;
(b) demonstrate the advantages of a well-conducted factory, equipped to take advantage of the highest market for cheese, butter, milk or cream;
(c) encourage the production of winter milk;
(d) conduct experiments and investigations relating to the manufacture of butter and cheese.
(e) demonstrate new processes and to try out new appliances;
(f) demonstrate the value of the cool curing of cheese; and
(g) study the economics of dairy factory operation.

Being responsible for the successful operation of this factory conducted on strictly commercial lines, the Dairy Branch is brought into close contact with the problems which confront other manufacturers of cheese and butter throughout the country.

The supply of milk at the Finch Station has been nearly trebled during the nine years of its operation, and for the year 1920 the average return to the patrons was about 30 cents per hundred pounds of milk higher than the average received at factories where cheese only was made. A considerable portion of the milk supply is sold to milk distributors in Montreal and Ottawa, either as milk or cream. With the necessary equipment to make butter or cheese, or sell milk and cream on short notice, the management is able to dispose of the products in the highest market prevailing at the time. It is believed that this type of dairy factory is a solution of some of the difficulties which producers have found themselves in during the last year or two in some parts of Ontario.

An important activity of the Dairy Division is the promotion of cow testing whereby records are kept in co-operation with the owner, of the individual cows in the herd. Records of over 33,-382 cows were kept in 1920. This work is entirely distinct from the Record of Performance Test carried on by the Live Stock Branch, which is official. The cow testing promoted by the Dairy Division is unofficial, as the owner of the herd weighs the milk and takes the samples for testing. The object is, of course, to show the farmer which are his best and which are his poorest producers, so that he can eliminate the poor cows and bred only from those which give the best returns.

A Dominion Educational Butter Scoring Contest was inaugurated in 1919 and has been continued since. The object is to develop uniform methods of manufacture throughout the various butter making sections to standardize the quality and to establish uniform grades throughout the whole Dominion. This Contest has demonstrated that butter of a uniform type and quality can be made in every part of the Dominion.

A new line of work was undertaken in 1920 in the grading of dairy produce for export. The grading has been limited so far to the grading of cheese for sale by auction at Montreal by an Ontario co-operative society, but the producers have expressed a desire to have the system extended to all dairy produce exported. A very important service in connection with the grading of dairy produce is carried on by the Division with a view to producing uniformity in the work of grading as carried on by provincial authorities in the different provinces. Conferences of the graders are held from time to time and classes in the grading of dairy produce are conducted by the Chief of the Division at the various dairy conventions and exhibitions held throughout the year.

The holding of conferences with the provincial dairy authorities not only in connection with the grading of dairy produce, but with reference to various other phases of government dairy work, has produced most excellent results, tending to co-ordinate and unify the work throughout the Dominion, to promote standard methods and practice and to serve as a means of education for all those who participate in these conferences.

An investigator of Dairy Weights and Measures is located at Montreal, and examines complaints of cheese and butter manufacturers as to the weighing of their products at Montreal.

EXTENSION OF MARKETS DIVISION.

Cargo Inspectors were appointed in 1900 to examine all cargoes of perishable produce as loaded on steamers at Montreal and other Canadian ports for export to the United Kingdom. Other Cargo Inspectors were located at London, Liverpool, Bristol, Manchester and Glasgow to examine the cargoes as discharged from the steamers. This service has been continued and improved from time to time. The names of consignors and consignees, the condition of packages and contents at the time of loading and discharge and the stowage plan of the cargo, etc., are noted by the inspectors. Recording thermometers are placed in refrigerated chambers and the record forms part of the detailed report which is forwarded to headquarters at Ottawa from both ends of the voyage on all steamers carrying perishable food products. Copies of these reports may be obtained by any person interested in particular shipments. Much improvement has resulted in the packing, handling and stowage of cargoes, and better ventilation of ordinary cargo space has been provided since this service was inaugurated.

A market reporting service for butter and cheese has been provided during the past two years in the form of a Weekly Market Letter, which is sent to every person who asks for it. Paid telegrams are sent twice a week to officials in various districts by whom the information is communicated to salesmen in the surrounding territory. Collect telegrams are sent direct to any salesman who makes a request for them. These telegrams give the prices paid on the Montreal and Toronto markets up to a few hours before they are sent out.

A Monthly News Letter, containing items of general interest concerning the dairy industry throughout the world is sent to every cheese factory and creamery in Canada and to any person who asks to have his name placed on the mailing list.

The enforcement of the Dairy Industry Act, and the enforcement of the Oleomargarine Act as it refers to the sale and use of oleomargarine, have been intrusted to the Markets Division. This work includes investigations into the adulteration of butter by excessive water and by foreign fats, weights of prints of butter, proper marking of butter, adulteration of cheese, proper branding of cheese, sale and use of oleomargarine, weights of prints of oleomargarine and proper marking of same, as well as prevention of mixing of butter and oleomargarine. In connection with this work the inspectors of this Division have power to confiscate dairy produce in connection with which illegalities have occurred, and they can also prosecute the manufacturer or dealer involved.

COLD STORAGE DIVISION.

In 1895 the work of organizing the cold storage services was begun by the Dairy Branch. The export butter trade of Canada, owing to improvements in other countries and keener competition abroad, had shrunk to almost nothing. There was no organization to provide for the carriage of butter in refrigerator cars in Canada, or in cold storage space for overseas shipment. No one could get a refrigerator car unless he had a carload to ship, and few creameries had any provision for cold storage. The Commissioner was authorized to arrange with the railway companies to run refrigerator cars once a week over stated routes for the carriage of butter in small lots. At the present time cars are run weekly on some 65 different routes from country points to Montreal and other market centres. The Government guarantees two-thirds of the earnings of a minimum car load from starting point to destination plus $8.00 per car for icing. Inspectors are employed at terminal points to note the quantities in each car and to see that the cars are in proper condition, and that they have been fully iced.

Precooling Plant, Grimsby.

Since 1897 the creameries have been encouraged to erect cold storage rooms by the payment of a bonus of $100 for a cold storage erected and equipped according to plans and specifications supplied free by the branch.

The steamship companies were encouraged to provide refrigerated chambers in 1896, when the Government offered to pay half the cost of installing the machinery on a number of ships. In the course of the next five years there were 34 steamers in the St. Lawrence trade equipped with cold storage space. Before the war all the regular steamships were equipped with cold storage facilities. With these improvements the export of butter increased rapidly until the maximum of 34,000,000 pounds was exported in 1903.

In 1907 an Act was passed authorizing the Minister of Agriculture to enter into contracts for the payment of subsidies to assist in the erection of public cold storage warehouses in places where no cold storage already existed. With this encouragement local cold storage warehouses were established at many points throughout the country, thus providing additional markets for perishable products of seasonable production to be carried over for consumption during the months of scarcity. This policy also had the effect of preventing the concentration of food products in the hands of large companies at central points. Since the inauguration of this law 34 cold storage warehouses have been assisted, with a total refrigerated space of 4,978,304 cubic feet, on which the total subsidy payable is $722,506.41.

VALUE OF THE WORK.

At the present time Canadian dairy products, especially cheese, has a high reputation on the English market, and while it would not, of course, be fair to credit all this to the work of the Dairy and Cold Storage Branch, there is no doubt that the latter's efforts towards the improvement of the dairy industry generally have been in a large measure responsible for an improvement in the quality of the milk products exported from this country. Again, before this Branch put into operation its system of cargo inspection, great damage resulted from the carrying of perishable products in poorly ventilated cargo space at a high temperature. The efforts of the branch have succeeded in educating shippers and carriers in the necessity of the proper packing and the carrying under proper temperature and ventilation conditions, of perishable products sent overseas, with the result, not only that much of the loss previously experienced is now eliminated, but the reputation of Canadian products has been considerably enhanced, by the better condition in which they can be offered to the foreign consumer.

The Cow Testing work is another feature which has resulted in great benefit to the dairying industry. When the cow testing propaganda was first started the average milk production for all cows was 3,000 pounds per annum, while today the average production is 4,000 pounds per annum, a large proportion of which increase is undoubtedly directly traceable to the work of this Branch.

* * *

Even though the earth lie wate and barren, it may still declare its nature; since a soil productive of beautiful wild fruits can by careful tending be made to yield fruits of the cultivated kind as beautiful.—Xenophon, "*The Economist,*" 434-355, B. C.

The Mail Box.

Criticism, Corrections, Opinion and Advice, By Review Readers.

The Editor, O.A.C. Review.

COMMENTING critically on my article entitled "The Virtues of Basic Slag," published in the April issue of the "Review." Mr. Henry G. Bell of the Canadian Fertilizer Association submits, in the June issue, data from the Experiment Station at Wooster, Ohio, which are at variance with those quoted in my article and obtained from experiments conducted, under my supervision, at Kentville, N.S., Kapuskasing, Ont., and Agassiz, B.C.

As pretext for bringing forward the Ohio results Mr. Bell urges (first) the desirability of "taking into account results obtained by all the leading experimenters," (secondly) the proximity of Ohio to Ontario, the experiments having been conducted "in localities much nearer to Ontario than are even the far distant provinces of this Dominion," and (thirdly) the freedom of the Ohio experiments "from any influence, either pro or con, towards materials used."

Insofar as they apply to myself, I would dispose of the first two arguments with the remark that results obtained from official experiments of which I had most intimate knowledge were quite naturally selected for special mention. The reader may judge of the insinuation implied in the third argument.

,It seems to me that Mr. Bell's position in relation thereto is more difficult of explanation. If prompted by a desire to quote results from experiments conducted under conditions most nearly representing those obtaining in Ontario, why does he overlook accessible official data on the subject acquired in Ontario itself? On page 72 of The Report of the Minister of Agriculture Province of Ontario, for the year ending October 31, 1918, appears the record of a test made to ascertain the relative influence of Acid Phosphate, Basic Slag and Bone Meal as phosphatic fertilizers for wheat. The results obtained are so remarkable as to warrant their reproduction here. Here they are:

Davis Farm

Plot No.	TREATMENT	Yield of Wheat pounds per Plot	Yield of Wheat bushels per Acre	Yield of Straw pounds per Plot	Yield of Straw tons per Acre
1	Acid Phosphate, 400 lbs.	75	31.25	165	2.06
2	Basic Slag, 500 lbs.	115	47.9	220	2.75
3	Bone Meal, 300 lbs.	72.5	30.2	187.5	2.34
4	Check	45	18.75	130	1.62
5	Acid Phosphate, 400 lbs.	79.4	33.0	190.6	2.38
6	Basic Slag, 500 lbs.	110	45.8	217.5	2.71
7	Bone Meal, 300 lbs.	50.6	21.0	119.4	1.49
8	Check	25.6	10.67	76.8	.96

"It may thus be seen that by using certain commercial fertilizers (Basic Slag) on wheat the yield was more than doubled. In figuring the average profit per acre derived from the use of these fertilizers we find the following as per table:"

Nature of Fertilizer	Quantity applied, pounds	Cost per ten	Cost per acre	Increased Profit per acre wheat at $2.00 per bushel
Acid Phosphate..	400	$30.00	$ 6.00	$28.80
Basic Slag	500	20.00	5.00	59.20
Bone Meal	300	68.00	10.20	11.00

On what grounds would Mr. Bell refuse the admission of these data to consideration? Does he suspect that they have not been secured under conditions "absolutely free from any influence, either pro or con, towards materials used"?

In The Farmer's Advocate of April 28th appeared a letter from Mr. Thos. H. Bracken, Orangeville, Ont., setting forth the results from a test made with equal weights of 8 per cent. Basic Slag and 2-9-1 fertilizer on grain. Measurements and weights taken by a government official showed that the Basic Slag produced a yield more than 12 per cent. in excess of that from the field which had been treated with the 2-9-1 fertilizer.

Mr. Bell cannot be ignorant of these and other equally striking proofs of the value of Basic Slag in Ontario agriculture. An irresistible proof of its value may be found in the rapid increase in its consumption, particularly as a fertilizer for fall wheat, in this province. Speaking recently in reference to the increasing use of Basic Slag on arable land, Sir A. D. Hall, former director of the Rothamsted Experiment Station, said: "Prior to the war it was customary to use for this purpose almost entirely super-phosphate (Acid Phosphate), but the experience of the last few years, when men were forced to employ Basic Slag to a much greater extent, has taught many farmers the value of basic slag upon arable land even of the lightest type."

Mr. Bell has misinterpreted Dr. Russell's statement that "So far as present information goes, these slags are of equal value per unit of phosphorus to agriculturists," which had reference actually to the *total* phosphoric acid content of slags produced by either the "Basic Bessemer" or "Open Hearth" process.

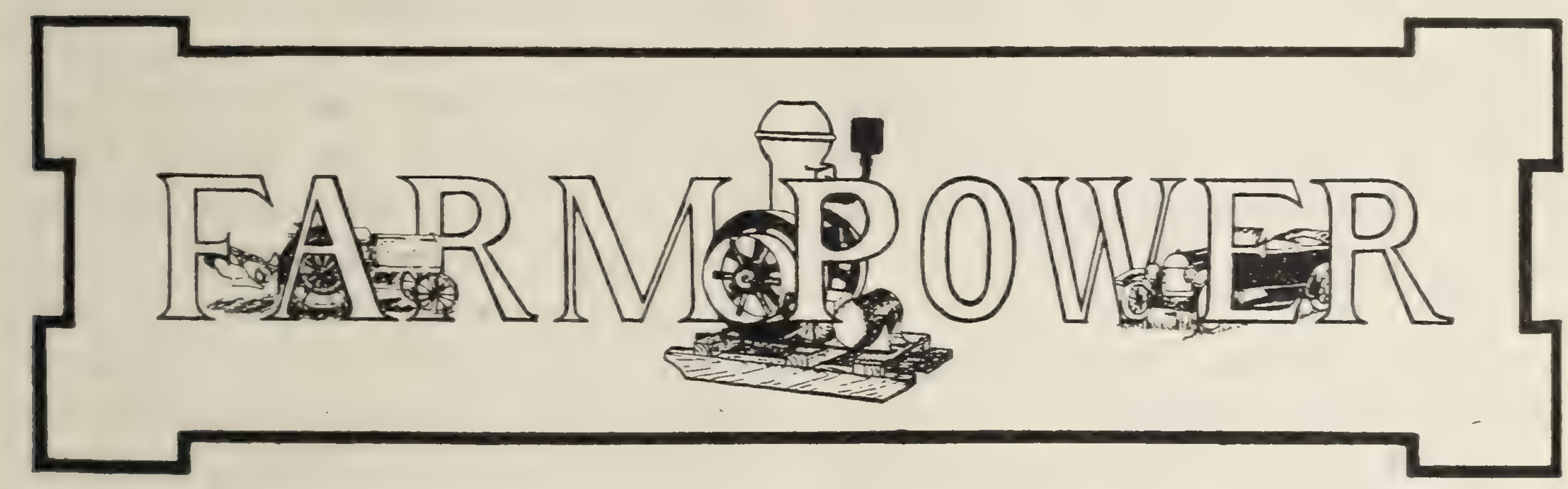
Regarding the grades of Basic Slag used in the experiments at Kentville, I would inform Mr. Bell that they were of 10 per cent. and 11.2 per cent. quality, as measured by the official test for "available" phosphoric acid in such materials.

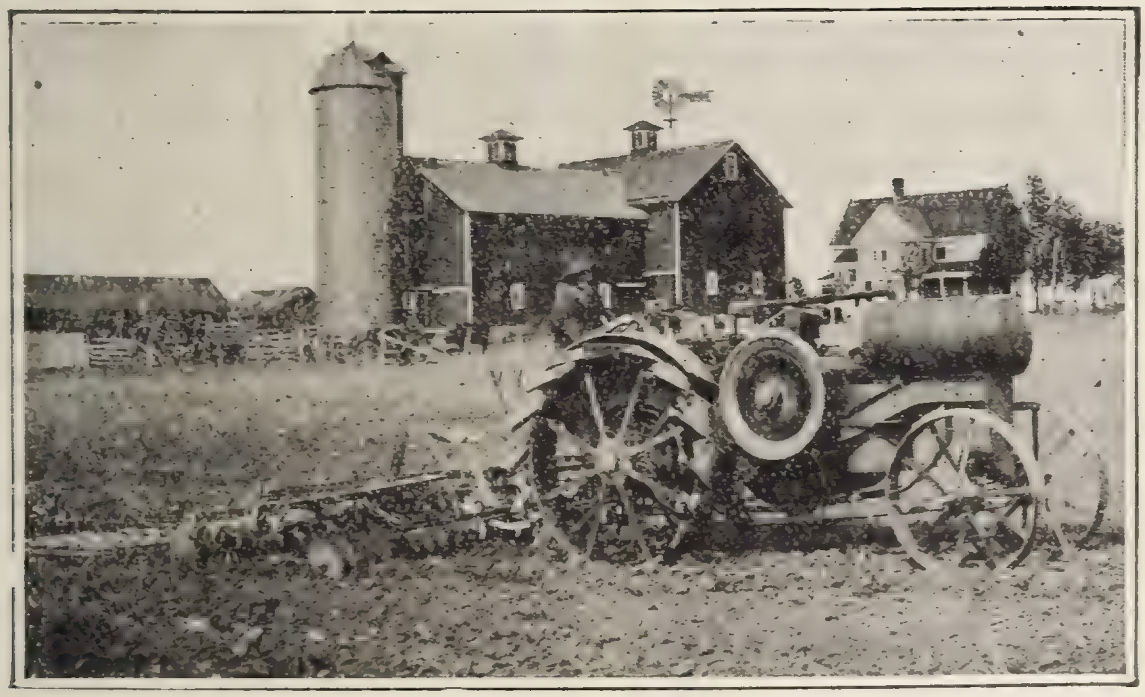
The "counterfeit product" hinted at in my article has, I note, been identified by Mr. Bell as "fully registered material, put out by Canadian fertilizer manufacturers." In this connection I repeat the statement that Basic Slag undoubtedly possesses a value beyond that indicated by its percentages of phosphoric acid and lime.

Were Mr. Bell free to do so, he could surely render greater service to the cause of Canadian agriculture, if, instead of indulging in futile efforts to detract from the well-established merits of Basic Slag, he would counsel farmers against the purchase of low grade fertilizers, such as 1-8-1 or 2-9-1 brands. The manufacture and sale of such, though legalized by their registration according to the provisions of the Fertilizers Act, constitutes an offence, aggravated by the extortionate prices which the farmer is asked to pay for them.

B. Leslie Emslie,
Agricultural Consulting Chemist.

* * *





Agricultural Engineering:

Why Should We Study It?

By L. G. HEIMPEL, B. S. A.

IN THE production of farm products, per man engaged in the industry, Canada stands higher than any other country in the world. This is not our place in the production per acre, which is the natural consequence of the conditions under which our Agriculture is conducted. These facts are due to the following causes:

(1) The least expensive commodity in Canadian Agriculture is land.

(2) The most expensive commodity is experienced, efficient and productive farm labor.

Whether our farmers recognize these facts in so many words or not, they are striving, all the time, to produce more per man. To increase our profits we must cut down the cost of production, the shortest and most effective way of doing which is to increase our production per capita.

This condition is not one which was born of the acute labor shortage occasioned by the war; this has been the tendency ever since agriculture became an industry of consequence on this continent. In connection with this the findings of an American statistician are very interesting:—

In 1830 ten hours of man labor produced 3 bushels of wheat.

In 1920 ten hours of man labor produced 60 bushels of wheat. In other words, from a cost of production standpoint, a farmer's time is twenty times as valuable as it was 90 years ago.

What is responsible for this increase in efficiency?

A considerable amount of credit is due to the introduction of new and better yielding varieties of the various crops, improved methods of culture and more intelligent farming generally. Yet the main reason is the introduction of labor-saving machinery. When we look back over the history of agriculture in America for the last century we find that the production per capita increased directly as the different forms of tillage, harvesting and threshing machinery increased in perfection.

The Average Farmer Does Not Study Mechanics.

Mr. White, a prominent agrciultural engineer in the U. S., recently made the statement that "Agricultural engineering has done more toward furthering agriculture on this continent than any other single factor." But farmers as a class have been paying no attention to the study of the mechanical side of farming. Our schools and colleges are only now making it a separate feature in their courses. The only man who has studied it is the manufacturer of agricultural machinery. He has studied it with one object only, that he might reap profits from his industry. This is the natural thing for him to do; far be it from us to find fault with him for it. Yet the fact remains that the manufacturer realized long ago that farmers were not engineers and took advantage of the fact. He knew that farmers will buy almost anything which would show some signs of being able to do the work. He knew that farmers never look under the paint on a machine to ascertain the quality of the material used in its construction; he knew also that farmers seldom, if ever, bothered their heads about the design of a machine; that farmers thought of construction only when a thing broke and that they never stopped to consider what the life of a certain machine should really be. Wide awake to these facts the manufacturer has given us machinery which works. Oh, yes! they all work, but he has seen to it that there is no better material and no more of that material in it than is absolutely necessary. While our machinery usually works it is true that the material is often not as good as it should and might be, that there is frequently room for improvement in design and that the construction is not such as to make for great length of service in the field. We should, however, put the blame where it belongs—on our own heads, because we never demanded anything better.

Some of us have realized these facts lately. The writer remembers an artcile by Peter McArthur on modern implement manufacture, the inspiration for which was supplied by a fight with a "round-headed" bolt. Thousands of men have similar fights with similar makeshift devices every day, but only one in hundreds ever thinks of demanding better construction in our machines. Truly we are not mechanical students.

Recently the writer tried to overhaul one of a species of farm machinery known as a side-delivery rake—by the way, perhaps the poorest excuse for a machine which has ever been turned out of an implement factory—which had been in use about seven seasons. Each season meant, at the most, about twenty hours of work, making in all about fourteen ten-hour days in its life. Fourteen days and such a sight! The teeth were worn out, one-third of them being actually broken and the rest so weak that they would certainly not rake anything but the very lightest of hay crops. The shafts holding the teeth, which were nothing less than three-quarter inch piping, were kinked and twisted, while two out of the three wooden bars holding the teeth were broken. Yet this machine had been subject to nothing more serious than is encountered in an average hay crop taken from clean fields on a Western Ontario farm.

We read and write about overhauling farm machinery, but after such an experience are inclined to add "if possible." Every bolt, and they were all "round-headed"—carriage bolts they are called—was rusted tight, and they all "turned." They couldn't help it, being 5-16-inch bolts put into 3-8-inch holes in a wooden slot. The only cure was a cold-chisel or a hacksaw and new bolts. We still advise overhauling farm machinery, but how much better would our machinery be if our forefathers "had put their feet down hard" and demanded something better in materials and construction. Then, too, our chances of making a success of an overhaul would be so much greater if we had a little more instruction in the selection, use and care of tools and equipment.

CONTRAST BETWEEN FACTORY AND FARM MACHINERY.

Upon your next visit to a factory—and it will pay to take a day off for the purpose—we would ask you to observe the stalwart construction of all machinery in use there. Compare our binders, mowers, grinders, gas engines—yes, even our tractors—with the machinery seen in our furniture, button, sugar factories or in any other place where the manufacturer uses machinery. You will find machinery which is subject to no heavier strain than our machinery mentioned having heavier frames, shafting and bearings than ours have; you will find machines with a pleasing hum instead of a loose clatter; you will find machinery built to run for years while ours runs for as many days.

We realize that our machines must be mobile and that too much weight must not be put on; we believe also that owing to the lack of care farm implements are subject to it would hardly pay to make farm machinery as elaborately as our factory machinery is made. There is some truth in these contentions, but why is it that binders grandfather used cut the crops of 100 acres for 15 seasons, while our binders to-day will cut similar crops for only from five to seven seasons? Old plowmen tell us that cast shares to-day wear down much faster in the same soil than did similar plowshares ten years ago, and we agree with them. Why is this so? Why is it that thirteen years ago a good two-horse gas engine weighed nine hundred pounds, had a 1 7-8 crankshaft and bronze bearings, while a two-horse engine of to-day weighs in the neighborhood of three hundred pounds, has only half as heavy a crankshaft and babbit bearings with pasteboard liners or no liners at all? Quality in agricultural machinery has no doubt depreciated much in the last decade, but why? The answer is that the farmer has had no one who interceded for him and demanded certain standards of quality in materials, design and construction, while all other industries have their mechanical necessities looked after by mechanically trained men.

Our governments are slowly taking this matter up and are, in some provinces at least, demanding that implement firms conform to certain regulations re the supplying of spare parts, but the regulations do not touch the three qualities above. The only way we can get a better quality of machinery is by studying the mechanical end of our industry ourselves and demanding it.

What About the Future?

To-day, more than ever before, the farmer is being offered new things in machinery. The manufacturer is wide-awake to the fact that his "best prospects" are in the country. He is offering "new" and "wonderful" tractors, electric lighting plants, water systems—new machinery of all kinds, to say nothing of new and untried building materials, for which much is claimed and little is known.

Studying these creations the writer found himself repeatedly thinking over such questions as the following:

(1) Judging from the length of life of an automobile storage battery, just how long will a two hundred dollar set of sixteen cells last in a farm lighting plant? Enquiring of the makers gets us no definite answer, yet we want to know. We should know before we instal such an expensive piece of machinery just what the current we are going to use will cost us per watt hour over a period of say five years.

(2) Water systems to be run with electric plants look very nice, but how do they compare in service and length of life with a good, reliable home-made system, the plans for which our Department of Agriculture will be only too glad to furnish free of charge?

(3) Some time ago the writer helped to replace a shingle roof, which had been giving good service for forty years, with cedar shingles. A sheet metal roofing salesman wanted to sell some corrugated roofing at $8.50 a square where shingles cost $5.50. He claimed the metal was better. Is it? The writer has his own opinions based on facts and doubts the agent's word. We want this information. These are only three of dozens of problems in agricultural engineering which our government institutions should find an answer for. The only way we can get the information is by investigation and the only way the farmer can get it is by getting after it through our educational and publicity services.

We believe that agricultural engineering will play an important part in increased agricultural production as well as in the bringing about of more desirable living conditions on our farms. It is true that much credit is due to manufacturers who in the distant past had a confidence great enough to stake their all in industries the results of which were then not too certain. Now, however, that the country is full to overflowing with all kinds of manufactured devices, many of them intricate and some of questionable merit, the time has arrived when the prospective consumer must study materials, design and construction if he would wisely choose his mechanical purchases, and he must study care and operation if he would successfully use our modern farm machinery.

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L. H. HANLAN, '22, *Agri.*
R. J. ROGERS, '22, *Exper.*
J. C. GRAHAM, '22, *Hort.*
R. A. HOCKING, '22, *Poultry.*
H. C. ELLIOTT, '23, *Farm Power.*
H. M. BARON, '23, *Alumni*

MISS E. WHITELAW, *Mac. Rep.*
MISS B. LAILEY,. *Asst. Rep. Mac*
F. B. HUTT, '23, *Col. Life.*
E. N. BUCKLEY, '23, *Athletics.*
McK. MCARTHUR, '24, *Locals.*
A. T. BROWN, *Apiculture*

EDITORIAL:

Promises.

READERS of The Review (we assume that even after some months of our editorial regime there are still a few such folk) will have noticed in the July issue several articles upon the organization and work of branches of the Dominion Department of Agriculture. This series is to be continued.

Prof. G. H. Unwin, who conducts the course in Canadian Literature, has found himself handicapped in the past by the lack of any textbook suitable for use in this study. He is therefore writing a series of articles upon Canadian Literature for publication in the Review. Upon this series the course in Canadian Literature in all probability will be based. (*Sophomores, a word to the wise should be sufficient!*) The first of this series appeared in the July Review, so that it is scarcely necessary for us to comment upon the timeliness and readableness of these articles. The worn-out—"fills a long-felt want"—is not simply a cant phrase when applied to such a series as Prof. Unwin's promises to be.

Another series which we are now able to present is "Chats About Great Musicians," by Mr. H. C. Fricker of '23. Mr. Fricker's qualification to handle such a subject with ease and authority is known very well to the student body and staff, and will be equally obvious to others who read this series of articles. His writing is its own best introduction.

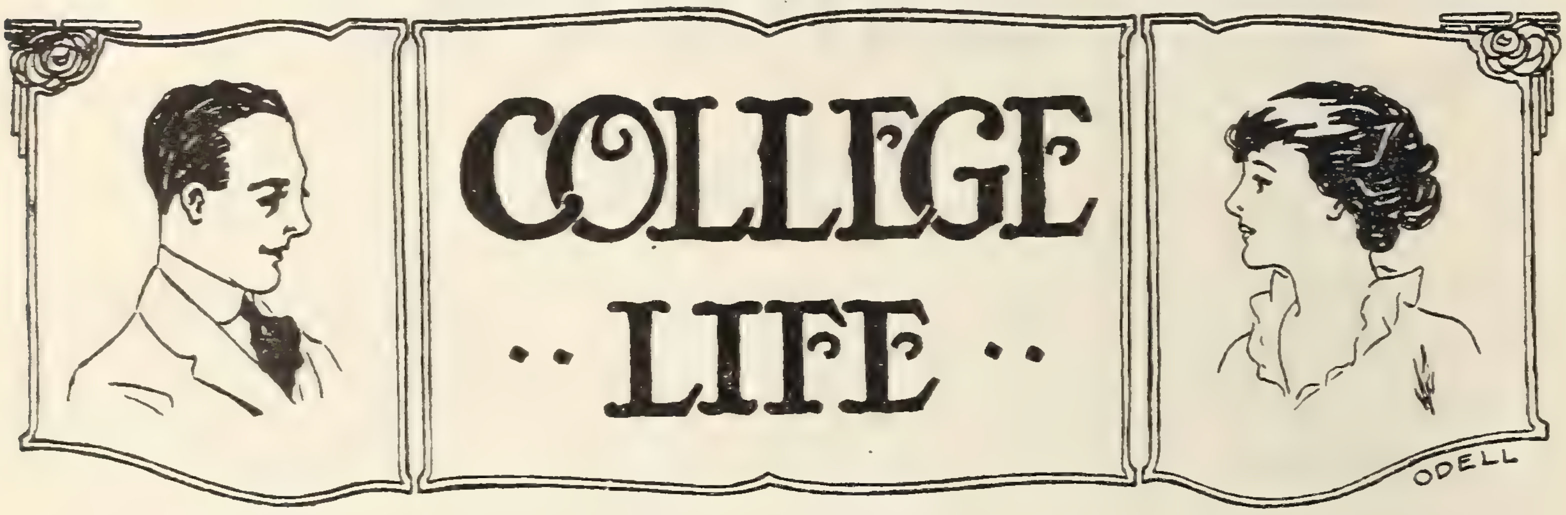
Editorials---and Roads.

Of the making of editorials there is no end. Every so often the harassed editor, regardless of inclination, has to grind out so much space-filler. He may not wish to write; he may have nothing whatever to write about; his ideas may be positively unwritable; but write he must.

So he sets himself to write, and after painful deliberation selects a subject and writes an editorial about and around it as best he may. Just what an editorial is or should be he does not know; but he writes an editorial nevertheless.

And when he has written his editorial, as for instance did our predecessor a year ago, predicting the speedy completion of the new road across College Heights, then up crop events and falsify his laboriously erected structure of prophecies.

Hence, O Reader, although we are convinced that the Dundas, Brock, Hamilton or Dairy road, as it is variously known, will soon be flung open as a finely-finished speedway, we hesitate to commit ourselves editorially. Nor can we be induced to depart from canny silence upon the tempting subjects of the new Dairy Building and the Veterinary College. We admit that work is under way, but beyond this—nothing. We intend to preserve a policy of watchful waiting.



DEAR BILL:—

Well, old timer, how's life down on the farm?—Same here!—If you don't weaken.

Been a lot of things doing here since you left. For instance, there's a gang of men at work putting in shower baths on Grub Alley and the Hunts. All they've done yet is to tear things up generally and spread plaster all over the landscape, but that's what they say they're going to do, anyway. It may be true.

Then there's the new road up the Hill. It'll likely be finished some time this year, if all goes well. I know you don't believe it, but it really looks as if the old mud-wallow is doomed this time. 'Twon't matter so much now if you do miss the last car.

Of course, you've seen in the papers that the new Dairy Building and the Veterinary College are under way. They are being built of tapestry brick in the neovandalian style of architecture and will add greatly to the available floor space. 'Nuff said!

Most of last month and part of this the old campus has been fairly swarming with school teachers—four hundred and some-odd of 'em cavorting nimbly on the green. They forgot their dignity and were just plain human beings for awhile, and I'll bet they feel better for it. Regret to report that some of the faculty were observed cavorting also—terrible example to the risin' generation and all that sort of thing.

Speaking of the faculty—say, Bill, you ought to see them in the summer time. They aren't half so lord-of-all-I-survey then as in the winter. Must be the warm weather. To see them out playing bowls and making excuses for poor shots, and laying it all on the green, and holdin' postmortems over every game, you'd think they were just plain folks instead of distinguished authorities. Poker ain't the only game where a good bluff counts, Bill.

Few weeks ago there was a course on for Rural Leaders—uplift stuff, Bill. You don't want to be uplifted, do you, you hardened old reprobate? Well, you're going to be if one of these Sinbusters ever gets hold of your community. Sinbusters? Sorry, Bill. I meant to explain that that's a rude slang term applied to the Rural Leaders. Honest, they aren't half bad; if you didn't know they were Rural Leaders you'd think they were quite normal. There may be something in this uplift dope after all; search me!

Talking about Sinbusters reminds me of the Sodbusters. Those boys are surely making a big hit everywhere they go. They ought to, with the show they've got. Have you seen it? If not, you can fix it up with George Patton at the Cosmopolitan Club here for a show down home. Did you see the write-up the Khan gave them? The proceeds are going for the Memorial Hall, of course, but there's no sign as yet of any Hall for 'em to go into. Cheer up! We'll have it all ready for the next war!

That's about all there is to tell this time. Some of the fellows are married and some are engaged, but I guess you'll see the announcements in the Alumni section. I wish you'd send us in a note now and then; you don't care a hoot how much or how little Alumni news there is, do you? Think we can fill it up on inspiration? Come across! Do you think I'm a mind-reader? Believe me, Bill, even a mind-reader's got to have something to work on.

Well, so long. Let's hear from you somewhere inside of four months this time. What's the matter with you, anyway? Pen paralysis?

Jack.

P. S.—Hydro's taken over the Street Railway and is going to put on a ten-minute service. And Sunday street cars, too- Progress, my boy, progress! But I wish they'd left us one quiet day a week.

Nearly forgot to tell you the doleful news: The Wyndham Inn burned down a few weeks ago, together with about half the block it stood in. No more cosy after-matinee teas at the Wyndham next winter; have to get the ban lifted from the Chink's, Bill. There's a chance for some bright Mac graduate to start a tearoom on the Hill now—got to feed the fussers somehow. But they say that everybody eats together in the dining-hall next winter, anyway, so perhaps you'll get enough of grinning at her across the table without a tearoom: or maybe you'll want a tearoom at the Club to retreat to for quietness; one never knows, does one?

ALUMNI

Notices are being sent out to all undergraduates of the O.A.C. who attended the College previous to the recent change in the course, which requires higher entrance standards, advising them that this is the last year in which students with the old third-year standing may continue for a degree.

Mr. W. H. Robertson, Assistant Horticulturist in the Lower Mainland District, B.C., has been appointed to the position of Provincial Horticulturist in the Department of Agriculture, Victoria, B. C.

Mr. Robertson, who is a Nova Scotian by birth, graduated from the Ontario Agricultural College in 1911, after which he became identified with the Horticultural Branch of the British Columbia department. He joined the C.E.F. in February, 1916, and was discharged from active service in the fall of 1919.

Mr. Reginald C. Treherne, Entomologist in charge for British Columbia, has been appointed Chief of the Division of Field Crop and Garden Insects. Mr. Treherne entered the service of the Department in 1909 and has since had a wide experience in the work of the Branch. Previous to entering the Dominion service he had experience in entomology in the State of Louisiana. Mr. Treherne is a graduate of the Ontario Agricultural College.

William Grant, '80, owns and operates a farm on the famous "Ridge," near Blenheim. One of his daughters, Miss Jean Grant, completed the Associate Course at Macdonald this spring, and another, Miss Agnes Grant, is expected to start the course this fall.

"Thunder" Presant and his brother, Harold, both O.A.C. men, are farming together near Blenheim. Young John Presant, aged about six months, has not yet decided whether he'll follow his father and uncles or not.

Campbell Graham, '17, is now located on a hundred-acre farm near Bowmanville. He is working gradually into poultry and small fruit. He is married and has two sons.

Reg. Lovekin, '17, is farming near Newcastle. Angus cattle, swine and apples occupy his attention. He is married, with one child.

Earl Bedal is another O.A.C. man on the land—near Brighton.

"Tom" Sirett, '17, is going in for apples and dairying down in the same district. He has some fancy Holsteins in which he is much interested, but spares some time for his family;—he's married, with two children.

Prof. Eric Millen of the Apicultural Department left recently for England, where he will join his wife in a two months' tour of the Old Country. In his absence Mr. Otto Sippel, '21, takes over the Department.

WEDDINGS.

W. F. Gardiner, '17, of Sarnia, to Margaret E. Lord, on the 11th June.

W. C. Adams to Helen Theodora Job, formerly Demonstrator in Normal Methods at Macdonald Institute, at Guelph, on the 23rd July. "At home, Westmount, Quebec.

Earl Snyder, B.S.A., of the Poultry Department, to Florence Cressman. They will live in Madison until the completion of Mr. Snyder's postgraduate course.

R. G. Knox, B.S.A., Lecturer in Animal Husbandry, to Gertrude Jones, sister of W. F. Jones, '23, at the home of the bride's uncle in Westmount, Que.

W. W. Gardhouse, '19, of Weston, to Bessie Macklin, also of Weston, on the 22nd June.

ENGAGEMENTS.

The engagement is announced of Pearl Ross, daughter of the late T. James Moore and Mrs. Moore, Guelph, to James Campbell McBeath, B.S.A., of Vermilion, Alberta, youngest son of Mr. John McBeath, Woodstock, marriage to take place quietly in Winnipeg on Wednesday, August 3rd.

J. B. Munro, '19, writes as follows from Armstrong, B.C. The Editor wishes sincerely that the Review had more correspondents of the same calibre.

Dear Alumni Editor:—

Whoever you are, I am sure you will have all the work you want during the summer, so just to lighten the burden a bit I'll jot down a few paragraphs regarding the British Columbia O. A. C. men inhabiting the Okanagan Valley.

The last time I saw W. T. Hunter, '14, he was making a pilgrimage through the Valley making a report for the Government on the Oriental ownership, leasing and working of farm lands. Usually Bill can be located somewhere within hailing distance of the Horticultural Offices in Vernon, where his commands are distinctly heard by the staff.

At Kelowna J. E. Britton, '14, is holding the dual position of District Supervisor of Agricultural Education and Representative of the Department of Agriculture. He seems to be finding it quite possible to serve two masters, but it doesn't leave him much spare time. Britton owns a small ranch near Kelowna and when the day is spent and the office door is locked he repairs to the ranch to contemplate the wonders of nature and prepare reports and a multitude of other documents that couldn't be finished during the day. Public life is just one thing after another.

Down toward the southern end of Okanagan Lake Arthur J. Mann, '18, and Bob Murray, '20, are employed by the Department of Agriculture. Murray is becoming somewhat of an authority on vegetables—or rather he is getting a reputation for what he has known for some time. During the winter he spoke at most of the Centers in the Valley, giving practical hints and suggestions to vegetable growers. I notice in my own locality that many of his suggestions are being acted upon with good results. Mann is a still a Tree Fruit man. His patient, persistent thoroughness is as evident as it was in his college day.

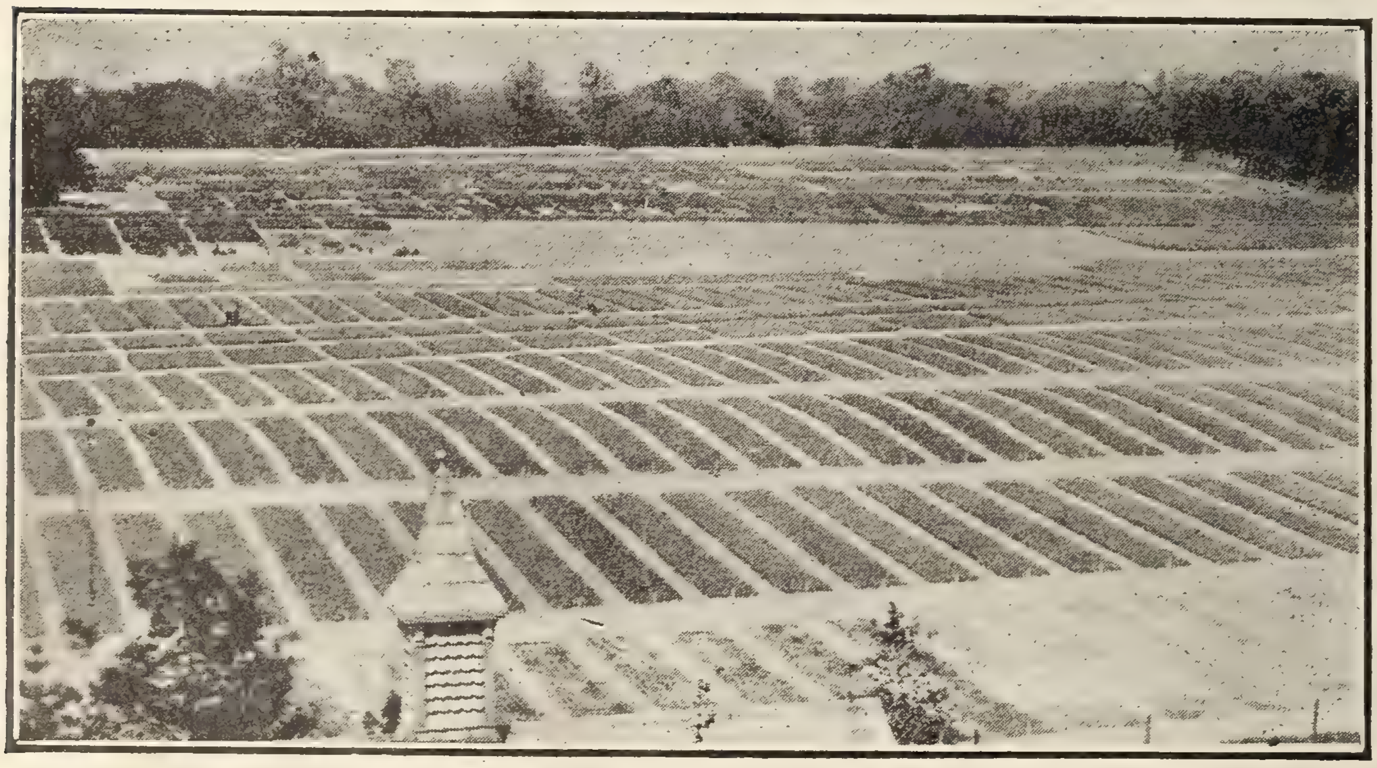
In speaking of myself, I cannot pay as many tributes as I would if I were someone else, but I can say that I have been happy, healthy, hard-up and busy ever since coming to this Valley. The climate and scenery are good and the neighbors are fully as civilized and enlightened as they are in Ontario, *outside of Toronto and Hamilton,* perhaps. The Okanagan Valley is by no means the paradise I used to think it was. We get inclement weather at times. Even hail storms and frosts blight our hopes on occasions. On the last Saturday in May the Northern Okanagan was visited with a frost of unusual severity and the farmers seemed to be a little short on Faith when they entered the Kirk next morning. However, the preacher showed them the spiritual benefits of a keen frost at that season and they looked better after the service. I wondered how the pastor could deal so cheerfully with so unpleasant a topic, but I see now. It happens that the clergyman supplying that day was from a pulpit farther south, in the section that wasn't hit by the frost . . . yes, the benefits of these frosts and hail storms depend on the angle from which you view them. In looking over my own garden I feel that the angle is "acute"; perhaps if my neighbor's garden alone was affected it would be "right."

During the first half of June rains fell daily in the Okanagan and water came down in torrents from the mountains. The crops are wonderfully improved and will, this year, be better than they have been for several seasons. Some of the O.A.C. men who are farming in the Valley will benefit directly. At Enderby Teece, who took his associate work with '15, is operating his farm, which is devoted to a variety of crops, including pears and apples. At Vernon the French boys are working their ranches in the most approved way. Jack Harvey, '24, is back in Enderby hardening his heart and developing his muscles on the land.

There are other men of the O.A.C. family in this section, but not having seen them lately I cannot report progress on their ranches or elsewhere.

After I have visited Victoria next month I will be able to write of the other fellows. This is just a donation that I hope may be acceptable.

* * *



'21

C. S. (Charlie) Nelson
Fenwick, Ont.

L. M. Ogilvie
Carberry, Man.

J. L. Pegg
Claremont—Farming.

E. F. Pineau
Live Stock Promoter
for N. B. and N. S.

C. W. (Charlie) Riley
Farm Economics Dept. O.A.C.

W. A. (Doc) Rowlands
Univ. of Wisconsin.

J. A. (Jack) Semple
S. S. B., Edmonton
Alta.

J. S. (Shoe) Shoemaker
Horticultural Dept.
Iowa, A. C.

R. H. Sibbitt
Kingston—Farming.

O. A. (Sip) Sippel
Dept. of Apiculture, O.A.C.

H. A. (Harry) Smallfield
Dairy Dept. O. A. C.

G. M. (Bushwa) Stirrett
Dept. of Entomology O. A. C.

F. W. (Fred) Stock
District Live Stock Promoter
Tavistock.

T. (Tom) Stoddart
S.S.B. Toronto.

W. J. Strong
Exp. Station, Vineland.

H. H. (Long) Taylor
Ottawa.

G. J. (Jerry) Thompson
Stanleyville—Farming.

W. D. (Doug.) Thomson
Whitby.

Howard L. Trueman
Dept. of Agriculture,
Woodstock, Ont.

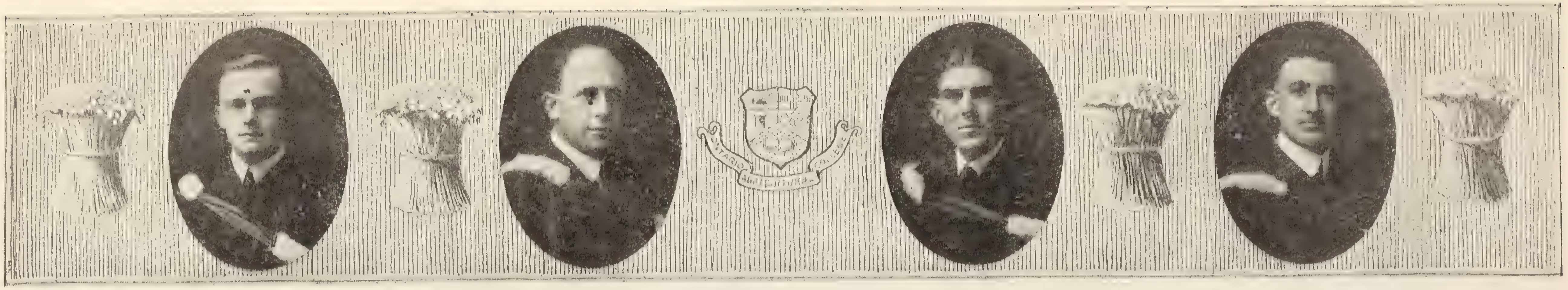
R. D. (Ray) Ure
Maidstone—Farming.

J. [illegible] (Jack) Wadsworth
Steele-Briggs Seed Co.,
Toronto.

Stirling (Jimmy) Waterman
Chemistry Dept., O.A.C.

A. L. (Al) Watt
Asst. Rep., Grey Co.,
Markdale.

H. G. (Shorty) Whillans
Hurdman's Bridge.



S. (Stan) White
Highland Creek—Farming.

G. A. (Dad) Williams
Postgrad. Ames, Iowa.

W. G. (Smoky) Wood
Rockton—Farming.

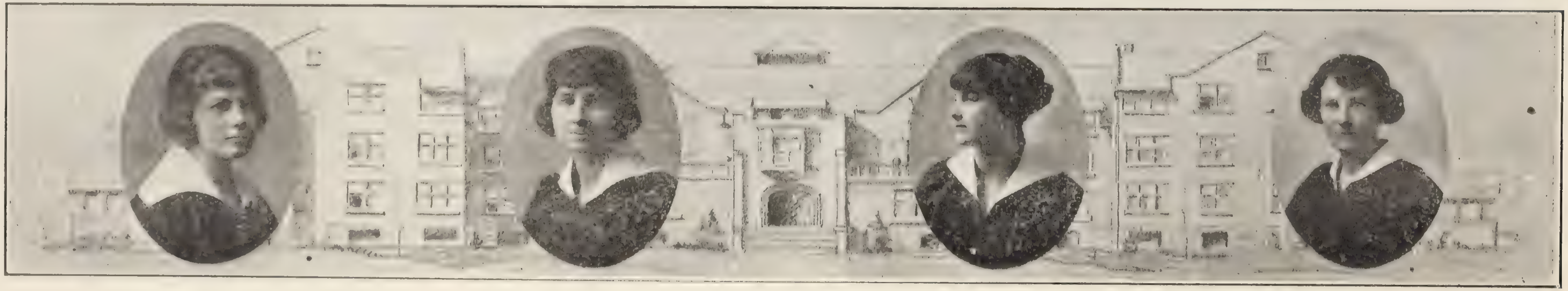
F. L. (Les) Wood
Dept. of Agriculture,
Fredericton, N. B.

Two things will be foremost in our memories of college days; the scenes on the Campus and the Hill, and the good-fellowship that there prevailed. Beauty and friends—what more can we ask of life? —*D. C. McArthur*—*A Toast to Alma Mater.*

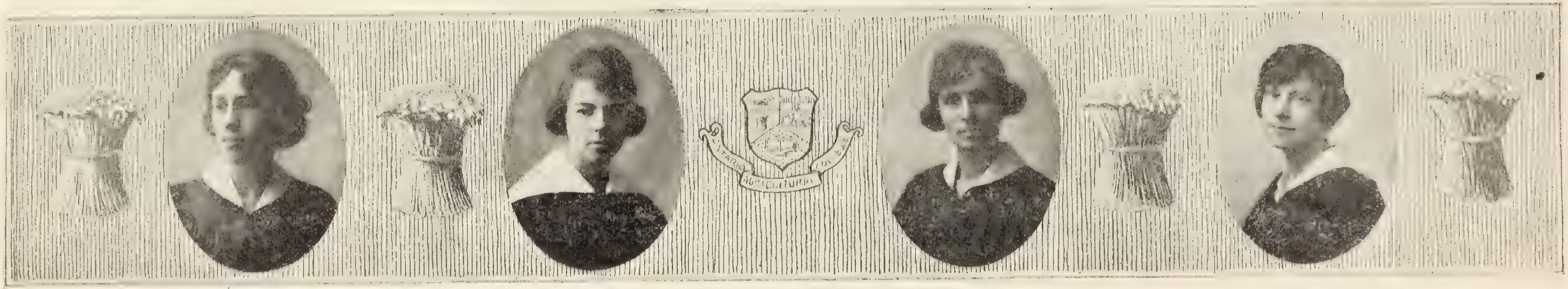
W. W. (Bill) Young
Brigden—Farming.

'21 MACDONALD

Violet Conn   Vera Douglas   Ruth Fowler   Jean Grant

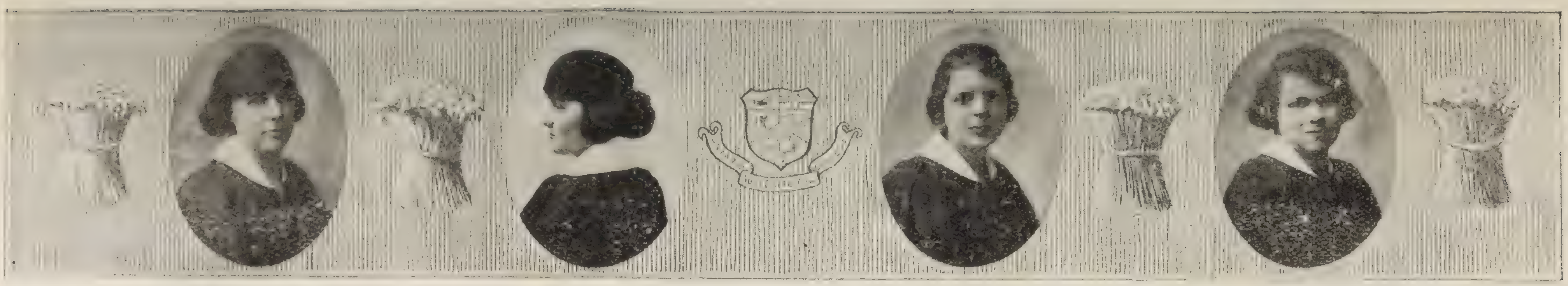


Marion Gunn   Lyla Kennedy   Beulah Leitch   Mabel Malcolmson



Clara Maxwell Marjorie Robinson Daisy Watts Edith Whitelaw

Jacqueline Wilson Velma Balkwill Marion Cody Dorothy Drew



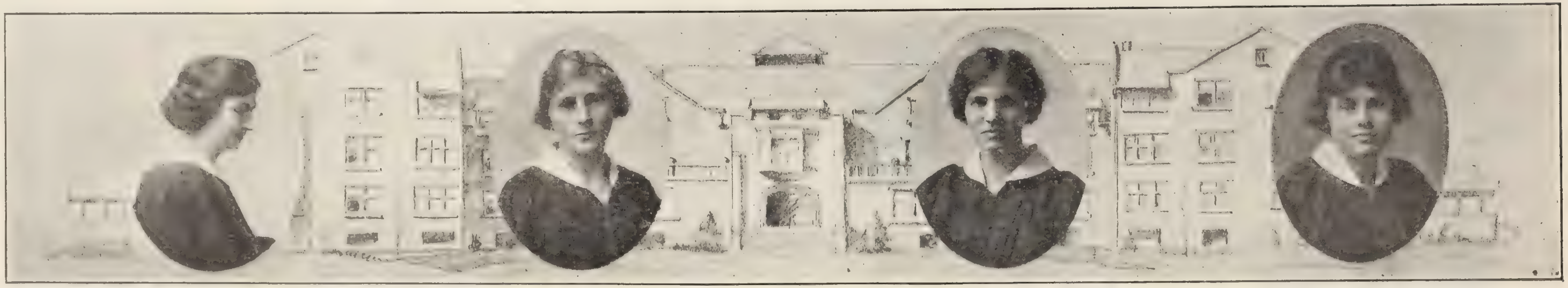
Eleanor Eadie   Margaret Foster   Lilla Freeborn   Mary Grant

Beatrice Higginson   Frances Kelly   Mary Kelly   Iva Langton

Helen Moore Ethel Morrison Mary Morton Mynonah McLeay

Dorothy Skey Vera Stock Bertha Yates Jean Gilchrist

Katherine Gilbert Ethel Hamilton Muriel Hutchins Maud Kennedy



Dorothy Kent Estelle McManus Ada Theal Gertrude Woods

Training

The 220 Yards

The same training as for the 100 yards is necessary for our best 220-yard runners go this distance at very high speed. For this event, the 100-yard man should jog through 150 yards or the full 220 yards about twice a week, and go through once a week at racing speed. In running the 220 yards the sprinter should go out the first thirty-five yards as in the 100. He should then settle into his stride and run just a trifle within himself up to 150 yards. From there to the finish he should put forth every effort. If the sprinter tries to run the first 100 yards at his highest speed, he will find that he will peter out before the 220 yards is reached. Those who lack the stamina for this distance should jog 330 yards or even a quarter-mile occasionally.

TRAINING SCHEDULE

Training should, of course, always be individual, but the following training schedule may be found beneficial.

100 Yards

Monday—A few starts. Two 35-yard dashes at full speed, and a swing through the 100 yards.

Tuesday—Starts as usual. Two 25-yard dashes. A 60-yard dash.

Wednesday—Starts. Three 35-yard. 120 yards, running at full speed the first and last 40 yards, and swinging along the intermediate distance.

Thursday—Starts. 60-yard dash. Two 35-yard dashes.

Friday—Starts. Two 35-yard dashes and a jog through the 100.

Saturday—Race day. If the sprinter has a race on, that is sufficient. If not, after limbering up well, let him run through the 100 yards at top speed.

220 Yards

In addition to the schedule for the 100 yards, the sprinter should jog through the 220 yards a couple of times during the week, and once a week run out the full distance, or 150 yards at top speed.

The sprinter should always limber up before getting on his mark for starting practice or for a race.

Middle Distance

The 440 yards and the 880 yards are called the middle distances, because they both combine both speed and "stay." Speed is absolutely required in the quarter, while the long distance quality of "stay" is absolutely necessary in the half.

The 440 Yards

The quarter can be almost regarded as a sprint distance, for it is run at a

(Continued on P. XIII.)

The Professor had, during an afternoon walk in the country, picked up a particularly interesting and particularly slimy lizard. He was anxious to preserve it for the college museum. But the Professor was a man of tender feelings, and the infliction of pain was odious to him. So when he handed the lizard to the janitor, "Kill him, Cox," he said, "in as—er—humane a manner as possible, and then kindly put him in alcohol for me."

"Yes, sir," said the janitor, with a deferential bow. The janitor was of recent appointment and anxious to cultivate the favour of the professor.

An hour or two later the professor returned to the laboratory to find the unhappy lizard lying at the bottom of a jar of alcohol, looking limper and slimier than ever.

"Is he dead, Cox?" he asked.

"Oh, 'e's dead enough sir," said the janitor, with an emphasis to imply that the lizard might or might not be satisfactory in other respects, but was certainly dead.

"How did you kill him?" asked the professor.

"E's drownded, sir," said Cox, solemnly, lowering his voice and speaking as if the lizard had perished in some great naval disaster.

"You don't mean to say," said the professor with much severity, "that you put the unhappy animal into alcohol alive?"

"Oh, no, sir!" said the janitor in his most deferential tone. "I put 'im in first and put the alcohol in atop of 'im."

There was a young man from Maid's Lane,
Who said temperance gave him a pain;
But his kicking was short,
For he swallowed a quart
Of Monohydroxymethane.

Consistency.

He hastened away to the dentist's
And made that good worthy rejoice
By ordering a set of fake molars
To go with his falsetto voice.

But He Was.

The boy stood on the burning deck,
It got hotter every minute;
He mopped his brow and simply said:
"I wish I wasn't in it."

Junior—"I hear Bill has left college on account of his eyes."

Ditto—"Yes, he couldn't see his way clear to go through."

All evening Renwick and Luke had studied with that concentrated manner which precedes exams. Now they sat dreamily looking across the campus, thinking of the future.

Renwick was the first to shatter the brooding quiet.

"I'd like to do something big and clean before I die," he murmured.

"Then go and wash an elephant," replied his spouse.

Down in the marshes a bullfrog croaked, thinking of the morrow.

"I cannot love another," he protested. It was not the first time he had expressed similar sentiments.

"Never mind," she whispered. "We don't expect you to. Mamma will be satisfied if you are friendly."

The motor purred softly and the speedometer never stopped for an instant.

MUFFLER NEEDED.

Mother—"I wish you wouldn't stand on the steps so long with that Junior when he brings you home."

She—"Why, I only stood there for a second last night."

Mother—"Is that all? I really thought I heard a third and a fourth."—*Gargoyle*.

Dean—"Why is it that you are always late at roll-call?"

Chisholm—"I think I must overwash."

Neighbour—"You reckon John will graduate this term?"

John's Pa—"He will if he kin git somebody to write his valedictory."

Man wants but little here below
As solace for his woes—
But woman wants a millionaire
To furnish her with clothes.

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Neilson's

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OFFICIAL CALENDAR

OF THE

DEPARTMENT of EDUCATION for the YEAR 1921

SEPTEMBER:

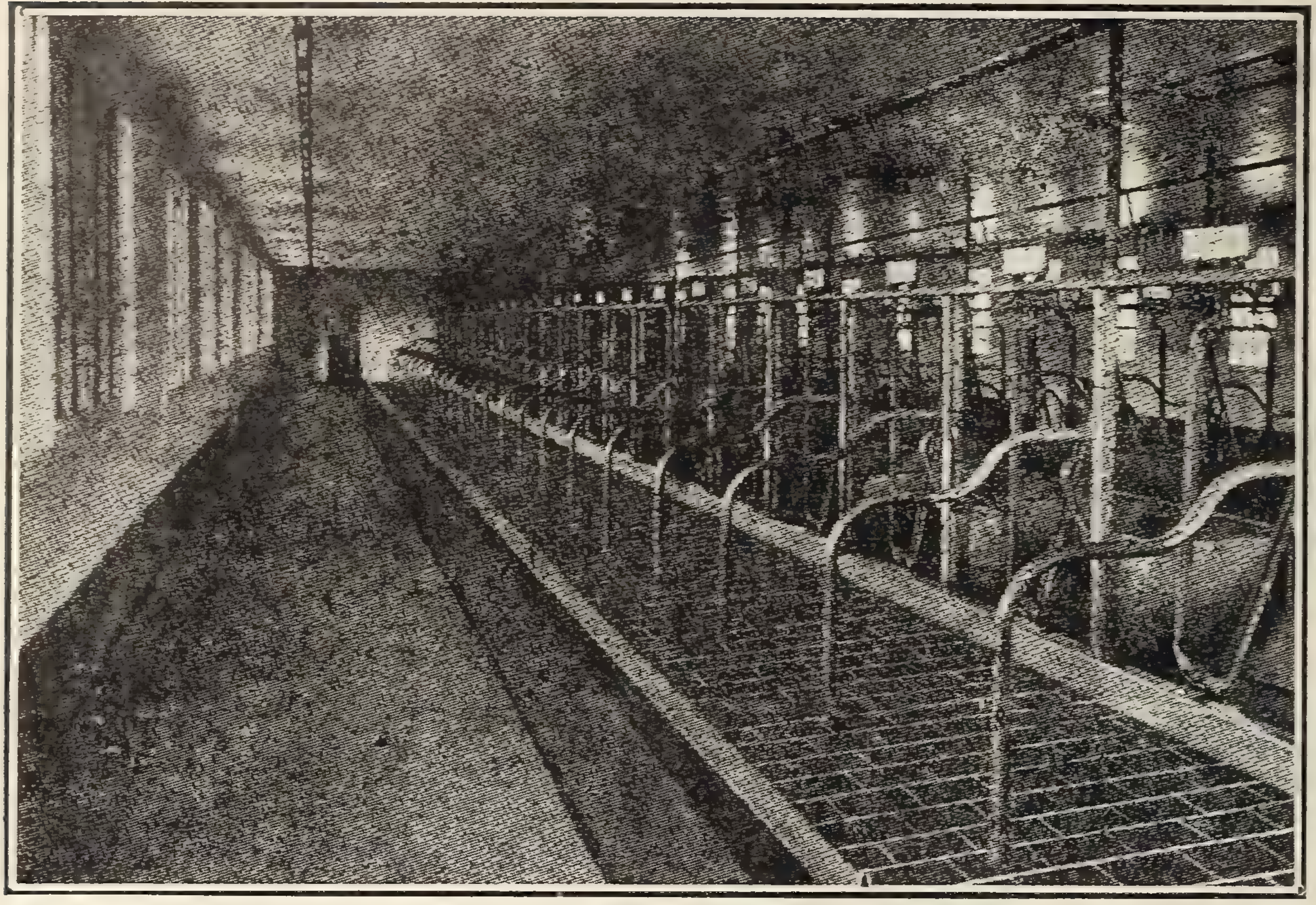
1. Continuation, Public and Separate Schools open. (*P. S. Act, Sec.* 7 (1); *S. S. Act, Sec.* 91). (1*st day of September*). Last day for receiving application to write on Supplemental Matriculation Examination (*Cir.* 24. (*Up to September 1st.*)

5. Labour Day. (1*st Monday in September*)

6. English-French Model and High Schools open. (*H. S. Act, Sec.* 52). (1*st Tuesday in September*).
Supplemental Matriculation Examination begins.

13. Provincial Normal Schools open.

30. Trustees to report to Inspector amount expended for Free Text Books. (*Before* 1*st October*).



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New Brantford "Type K" Kerosene Engines

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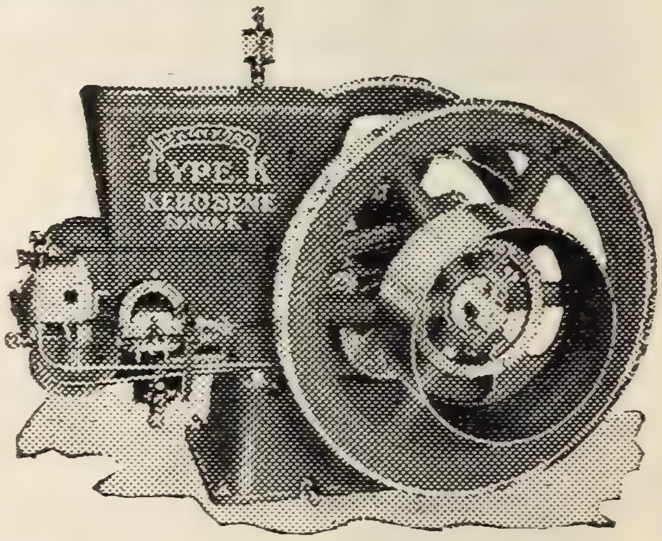
Kerosene Light Tractors, Grain Grinders, Saw Frames; Pumps, Tanks, Water Boxes, Concrete Mixers, etc.



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is proved by the thousands of creamery men, cheese makers and dairymen who never neglect the protection this cleaner provides to their manufacturing process.

Wyandotte Dairymen's Cleaner and Cleanser has a natural cleansing and purifying action which quickly convinces the user of its distinctive efficiency and when he knows how harmless it is to use and how exactly it meets his needs he is satisfied to remain a constant user of this unusual product.

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Minnesota State Fair Grounds.

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When you buy at Cohen's you pay the same price as your neighbor pays—and your neighbor pays the same price as the customer from the other end of the city, or from the country.

All Our Prices Are Marked In Plain Figures

Just look at the ticket—the price is there—the ONE and ONLY price at which we'll sell the article.

COME — SEE — COMPARE

SMITH'S
Furniture Store
FREE DELIVERY
Within A Radius of 15 Miles

CARELESS SWAIN.

His fellow clerks gathered round him when the news became public property, and extended congratulations.

"But," said one man, "I understand the girl you are engaged to is a twin; how do you tell the difference between her and her sister?"

"Well, it's a jolly nice family," said the lucky man, "and I don't bother very much."—*London Tit-Bits.*

Inquisitive Tommy—"Say, pa what is 'sic transit'?"

Intelligent Pa—" 'Sic transit'? Why, an ambulance car, of course."

WHAT HE SAID.

Professor—"So, sir, you said that I was a learned jackass, did you?"

Freshie—"No, sir, I merely remarked that you were a burro of information."—*Boston Transcript.*

KLINE
Fanning Mill

Farmers only wanting the best mill made, write us, not because we say it is the best, but our customers say no other mill can Equal the Kline. Separates all kinds of grain, even Oats from Barley. The Kline has separated wheat from barley; also perfect separation of wold oats.

KLINE
Fanning Mill Co.
480 Crawford St., TORONTO ONT.

(Continued from P. 609)

high rate of speed. This quality (speed) is the most necessary for this distance. The best quarter-milers all practice sprinting continually. They must be fast to carry the pace necessary and have a fair amount of stamina. The best quarter-milers have done the 120 yards in 12 seconds and 22 seconds for the 220 yards. Thus, great attention must be paid to sprinting, so that the runner can stand the fast pace he will meet in the first 300 yards of the race.

Here again the athlete must study his peculiarities. If he finds the quarter too long for him, he should then take occasional jogs for half a mile or smart runs at 500 and 200 yards. But he should not neglect his sprinting in any case. If, on the other hand, the athlete has plenty of stay but lacks speed, then he should pay especial attention to sprinting. He should run 220 yards at full speed occasionally. He should also go along for 300 yards or 350 yards at a fast quarter mile pace. This will give him practice in the fast pace necessary and his stay will keep him going the rest of the way.

Form is very important in the quarter. The pace is so fast in this race that an easy action is almost necessary. Maxey Long, the present holder of the world's record of 47 seconds, was perfection for the quarter. His style combined length of stride with ease of action, and he was thus able to keep up a very fast pace for the full distance. The quarter-miler should have a long swinging easy gait.

The sprinting start is generally used in the quarter. The first forty or fifty yards of the quarter is generally run at sprinting speed, but then the runner should settle down to a long, easy, fast swing. This will carry him to the stretch and then he must come home as best he can, remembering that a conscious effort to retain form and keep the stride out will help toward a fast finish. It is very important that the quarter-miler should have good arm-and-body action, as the length of this race and the high-speed require that the whole body should work harmoniously and smoothly. Speed, stay, length of stride and smoothness of action are then the requirements for the quarter.

Schedule for Training

Monday. Starts and short sprints. 300 yards at quarter-mile racing speed.

Tuesday. Starts and short sprints. 220 yards at a fast gait. After a rest, an easy quarter.

Wednesday. Starts and short sprints. 500 yards, the first 250 yards at a good racing clip and the last 250 easily.

Thursday. Starts and short sprints. 100 yards fast. After a rest, 440 yards at a fair jog, finishing the last 60 yards fast.

Friday. Starts and short sprints 250 yards at racing speed, finishing the quarter at a jog.

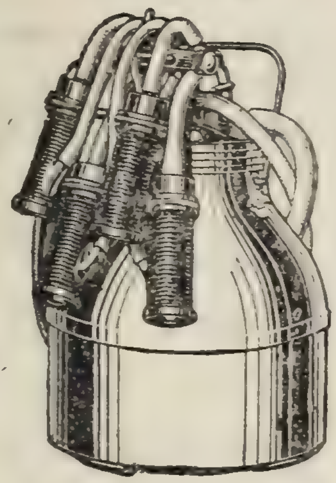
Saturday. Race day. 440 yards on time.

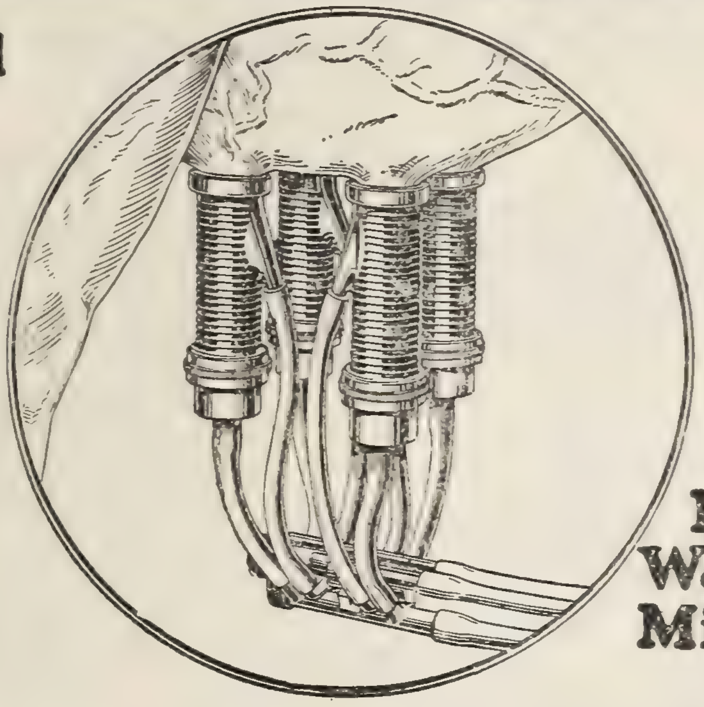
880 Yards

This race is based on stamina but it is yet in the domain of the middle distances, and this means that the speed factor is very important. The quarter mile lies just outside the boundary between the sprints and the middle distances. The half-mile is just inside the distance limits. In other words, stay is more important than speed for the half. Here again the long, easy strider has the advantage, although many good half-milers have been short men and short striders. The world's record was made

(Continued on P. XXI.)

The De Laval Milker





A Better Way of Milking

Better Than Hand Milking

"We get more milk—considerably more—with the same cows on the same feed, and we believe this comes from the even and regular pulsations. Every cow is milked exactly alike every morning and night, and that is better than we can do by hand."

This is a statement from a De Laval Milker user which we have just received. There is nothing unusual about it, as we have hundreds of letters from De Laval users equally as good. North, South, East and West, De Laval Milker users are proving that it is "A Better way of Milking." It produces more milk and saves time. It increases production and decreases the cost of production. It is the most useful, satisfactory and profitable piece of equipment a dairyman can own.

Sold on such easy terms that it will pay for itself while being used. Write for full information.

The De Laval Company, Limited
Montreal, Peterboro, Winnipeg, Edmonton, Vancouver

Sooner or later you will use a
De Laval
Milker or Cream Separator

Guelph Business Directory

The attention of the O.A.C. and Macdonald Students is drawn to the following directory of Guelph business and professional men. Their advertisements help to make your magazine a success. They carry the best goods and give the best service you can obtain. It is only fair that you patronize them.

Automobile Accessories—
- Tolton Bros.
- Guelph Tire Sales & Vulcanizing Co.
- Guelph Tire Hospital.
- John Rhienhardt.

Banks—
- The Merchant's Bank
- Union Bank
- The Bank of Hamilton
- Bank of Nova Scotia

Barbers—
- R. H. McPherson
- Lewis Watts
- Corrigan Bros.

Cafes—
- Alhambra Lunch.

Candy and Ice Cream—
- Candyland
- Royal Candy Works

Custom Tailors—
- Campbell & Johnson
- R. J. Stewart

Druggists—
- Alex. Stewart
- Liggett's.

Dry Goods and Ladies Wear—
- Guelph Outfitters.
- D. E. Macdonald & Bros.
- Cole Bros. & Scott
- G. B. Ryan

Electrical Appliances—
- Albert W. Smith
- The Grinyer Co.
- Stevenson & Malcolm

Furniture—
- H. Cohen
- W. S. Smith

Gents' Furnishings and Tailors—
- D. E. Macdonald Bros.
- G. B. Ryan
- Guelph Outfitters.

Hardware—
- The Bond Hardware Co.
- Cronk & Buchanan
- Howden Hardware Co.

Jewellers—
- W. G. Singer
- Pequegnat & Sons

Laundries—
- The Globe Laundry
- U. Wing, O. K.

Magazines and Newspapers—
- J. C. Wallace

Musical Instruments—
- Mason & Risch

Printing—
- The Guelph Herald

Pressing—
- Wimpenny.

Shoe Repairing—
- J. D. McArthur
- Goodyear Shoe Repair Co.
- Bridges.
- Stovell.

Storage Batteries—
- Guelph Battery Co.
- Guelph Battery, Service and Sales

Taxicabs—
- C. L. Kearns. Phone 41w

Toys and China—
- Hiscox Bros.

Tea Rooms—
- Wyndham Inn

Tuck Shop—
- J. F. Kurtz

Tire Repairers—
- Guelph Tire Sales and Vulcanizing

Undertakers—
- Tovels

You will be doing the Review a service if you tell these people you have read their advertisement.

It All Depends Upon The Man

He has a right to the best suit of clothes his money can buy. He can get a good suit as easily as he can get a bad one. It depends upon him to get the best.

MACDONALD'S, whether they are regular fancy woolen suits, or tropical suits for summer wear, are all as fine suits as can be had in the country for the money they cost, and they are here for that reason, and that reason alone.

The test of every man's suit that comes into this store is quality, service, value—never cheapness.

The suits that meet the best are here at prices as low as a man who knows what's what in clothing qualities, clothing values and other things, will want to pay.

"We Shall Not Break Faith"

D. E. Macdonald & Bros. Limited

GUELPH'S LEADING AND LARGEST STORE

For the Man of Vision

The London Life "Canadian" Policies have been specially devised for those who look ahead.

The adjustable feature makes it possible to adapt one's policy to any change in one's circumstances; a privilege which is unique in Life Insurance practice.

The London Life Insurance Company

HEAD OFFICE - LONDON, CANADA

T. M. MATTHEWS - - - REPRESENTATIVE

EGERTON RYERSON — OUR FOUNDER

Needing

Lanterns or Slides?

We carry the best Stereopticans for various projection purposes and will be glad to advise you. Projection apparatus of all kinds carried in stock.

Write us about anything in Photography.

We not only carry a stock of and Rent Slides, but also Make them from your films or photo prints. Expert workmen carefully supervised assure satisfactory results

A large number of slide-sets with lectures on various topics are carried.

The Ryerson Press

Toronto - Ont.

HOWDEN HARDWARE CO.

Dealers in GENERAL HARDWARE, Paints, Varnishes, Oils, Leads, Glass, Putty, BUILDERS' SUPPLIES and FARMERS' SUPPLIES.

Stoves, Graniteware, Tinware and Kitchen Utensils.

... ... 30-32 Macdonnell Street ... ...
Phone 964 Guelph, Ont.

PHIPPS

The Watchmaker

The man who has made watches can repair them.

19 Quebec St. Phone 456

ALFRED TOVELL

Funeral Director

44 Quebec Street West.

Phone 293. Residence Phone 360

OSCAR CRANE

..Automobile repairing, any make of car...
.... Storage ....
.... .. 10-14 Macdonnell Street. .. ....

LANE

LADIES' TAILOR

36 Quebec Street.

ALHAMBRA

BOX LUNCHES

Meals All Hours

Open 6.30 a.m. to 11.00 p.m.

C. P. WOOLDRIDGE

50 Cork St. Proprietor

OUR RANKEST PUN.

He called her a poem,
But later 'twas worse;
To all of his plans
She was always averse.

WILLARD

STORAGE BATTERIES

A still better Willard Battery with Thread Rubber Insulation always in stock to fit any make of car or tractor.

Expert repair work and Real Service to any make of Battery.

Willard Service

Station No. 1139

Guelph Battery Service & Sales

Phone 1086J Wyndham St.

Guelph

The mind of the farmer, like his soil, must have cultivation if there is to be an ample harvest. Those who neglect culture and refinement cannot enjoy wealth and leisure if these are acquired. Life is not worth living without an appreciation of the true and beautiful in life.

But let the good old crop adorn the hills
our fathers trod;
Still let us, for His golden corn, send up
our thanks to God.
—*Whittier.*

The agricultural population produces the bravest men, valiant soldiers, and a class of citizens the least given of all to evil designs.— *Cato.*

Not rural sights alone, but rural sounds exhilarate the spirit, and restore the tone of languid nature.—*Cowper.*

That startling gentleman who sports a bowler hat and answers to the name of Blondy. His snatches of operatic tenor echo weirdly through the upper corridors of Mill's Hall most any time. On Field Day he carried off the broad grin in grand style, and he can be generally counted upon for a laugh even at the most inopportune times. Do you know him?

THE HOUSE OF
Good Service

Equipped to repair tires, tubes, batteries recharged; motors and generators rewound and rebuilt.

GUELPH TIRE SALES AND VUL. CO.
Phone 1124... ...156 Wyndham St.

Come to the
Tuck Shop

We cater to Students
High Class
Groceries, Confectionery
Pastry, Ice Cream
and
Smokers Supplies, etc.
Dainty Lunches Served
Phone 250.

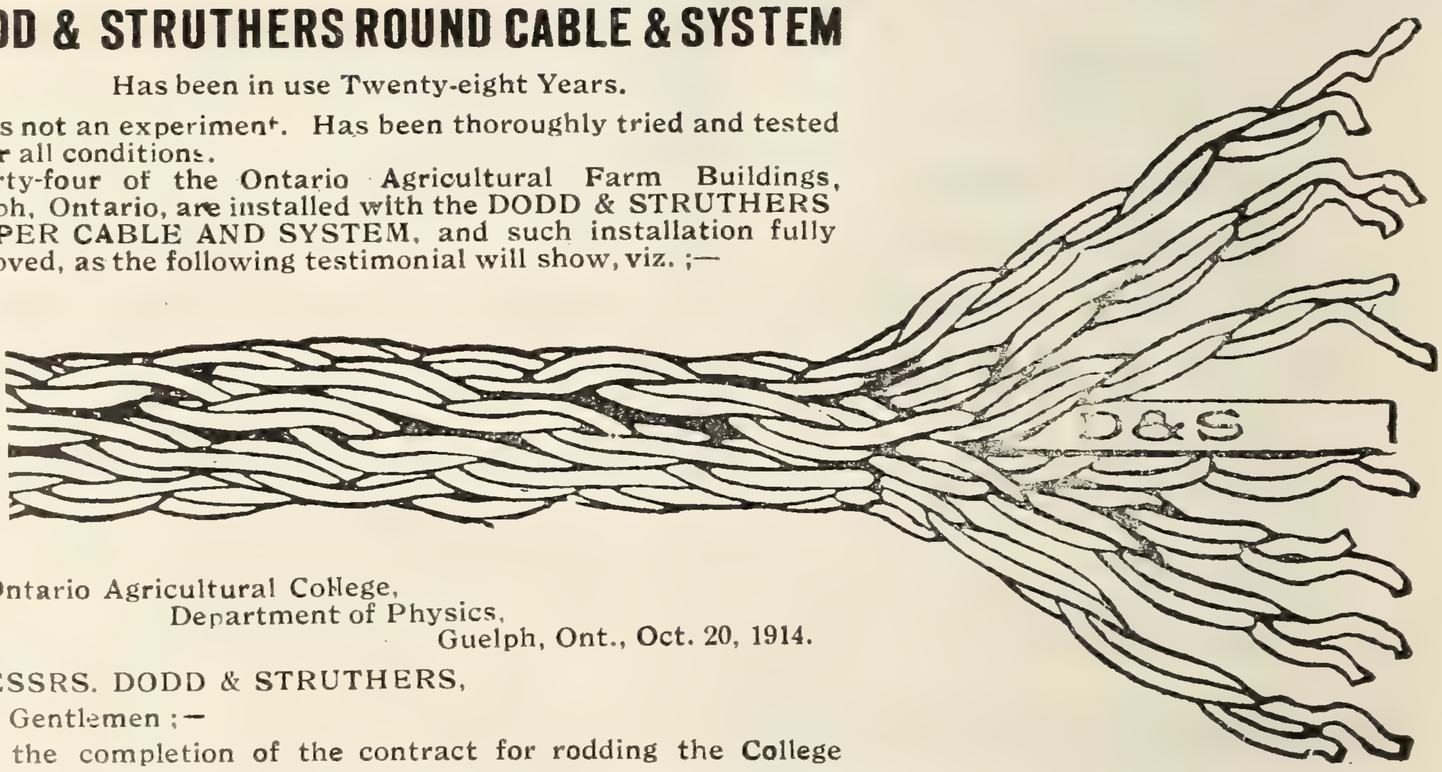
J. F. Kurtz
Prop.

DODD & STRUTHERS ROUND CABLE & SYSTEM

Has been in use Twenty-eight Years.

It is not an experiment. Has been thoroughly tried and tested under all conditions.

Forty-four of the Ontario Agricultural Farm Buildings, Guelph, Ontario, are installed with the DODD & STRUTHERS COPPER CABLE AND SYSTEM, and such installation fully approved, as the following testimonial will show, viz. ;—



Ontario Agricultural College,
Department of Physics,
Guelph, Ont., Oct. 20, 1914.

MESSRS. DODD & STRUTHERS,
Gentlemen ;—

On the completion of the contract for rodding the College Barns and Residences, I beg to state that the work was finished up satisfactorily and in good time. I have inspected every building that was rodded and must say that the job is a most complete one. Not only have the skeletons of the system been well looked after, but all exterior and interior metal portions and fittings have been taken care of in a minute and satisfactory manner. Roof-gutters, conductor-pipes, steel hay-fork and litter-carrier tracks, cow-stanchions, metal frame work, etc., have all been connected at their upper extremities to the rods, and at their lower extremities either grounded or again connected to the rods, so that I consider the installation complete in every particular, and I wish to express our appreciation of the work done.

Yours very truly.

(Signed) WM. H. DAY.

PEDLAR'S "GEORGE" THE LARGEST STEEL SHINGLE MADE

Pedlar's Steel Shingles

MADE IN CANADA

THE value of the farm buildings destroyed by fire in Canada in 1920 was over $2,000,000.00. Most of the fires was caused either by lightning or fire from falling sparks. Probably all of this tremendous loss could have been saved by steel roofing, properly grounded. The ideal steel roof for barns is the Pedlar's "George" Shingle. This is the largest shingle made—24 x 24 inches. Its large size results in a better, stronger, more durable roof, and a roof that is cheaper to put on, because you handle only 25 shingles to the square.

Why not know the facts? It costs you nothing to find them out. Simply mail us the coupon and we will give you, without any charge whatever, an accurate estimate of the cost of covering your buildings with Pedlar's Steel Shingles and Metal Siding.

The
PEDLAR PEOPLE Limited
(Established 1861)

Executive Offices, Oshawa, Ont.

Factories, Oshawa, Ont., and Montreal, Que.

Branches: Montreal, Quebec, Halifax, St. Johns, N.B., Ottawa, Toronto, Winnipeg, Calgary, Vancouver.

FILL IN AND MAIL COUPON TO-NIGHT

The Pedlar People, Limited,
Dept. O.A.C., Oshawa, Ont.

Kindly send me an estimate for roofing and siding a building of the following measurements:

Length of Roof........Length of Refters...........Height of Posts

..........Width of Bars..........

Name ....

Address ....

....

(Continued from P. XIII.)

880 Yards Con'td

by C. J. Kilpatrick in 1 minute 53 2-5 seconds; he covered the first 440 yards in 53 2-5 seconds. A corresponding pace may be expected in running this distance. The average boy running the half mile in 2 minutes 5 seconds should do the first quarter in 59 seconds. It will be found that in all distances, from the quarter up, the best speed must be obtained in the first part of the race. The half-miler must then run 440 yards and 220 yards and do some sprinting in order that he may develop speed, for otherwise he will not be able to stand the fast pace for the first quarter. He should also do some training at one thousand yards and even the three-quarter mile to develop stay. The best distance for getting the half-mile race is 660 yards. This can be run at half-mile racing speed without distressing the athlete, while at the same time it gives him practice in the pace he will have to carry in a race.

Condition and form are always important. The most successful half-milers have been rather tall with a long, easy stride. The pace is so fast that a long, easy strider will have the advantage over the short strider or the runner who plods along in poor form. Many good half-milers who lack form overcome such difficulties by great staying qualities. Some English runners give a miserable exhibition of form but they have so much stay that they keep going and cover the ground in fine time.

OPTICAL GOODS, Prices 25c to $5.00
WATCH REPAIRING, 25c to $2.00
CLOCK REPAIRING, 75c to $1 00
Watch, Clock and Jewelry Cleaners and Repairers
Guaranteed Work Second to None
OPTICAL GOODS
Gold. Gold-Filled and Silver Spectacles and Eye Glasses
Reading Glasses and High Power Glasses for Fine Seeing
E. J. LIPHART, Jeweler and Optician
25 Quebec St. West

All young runners should strive for easy action and a long stride if they are candidates for the half-mile. The runner in training must not be too anxious to lengthen out his stride, for then he will overstride, and this, being exhausting, is worse than understriding.

The athlete must study his own shortcoming. If he has stay without speed then he should devote much time to sprinting and 440 yard running. If, on the other hand, he has the speed but lacks staying qualities, then he must run over the half, running one thousand yards, three-quarter miles, and even miles occasionally.

Weekly Schedule for Training

Monday. Two or three short sprints, 880 yards, the last 220 yards at good speed. If not tired, jog a quarter.

Tuesday. 660 yards at half-mile racing speed, finishing out the half in easy fashion. After a rest, jog a quarter.

Wednesday. Two or three short sprints, 1,000 yards, running the first quarter at half-mile racing speed and striding out the rest of the distance.

Thursday. 300 yards fast, paying especial attention to the stride. After a rest, an easy half-mile.

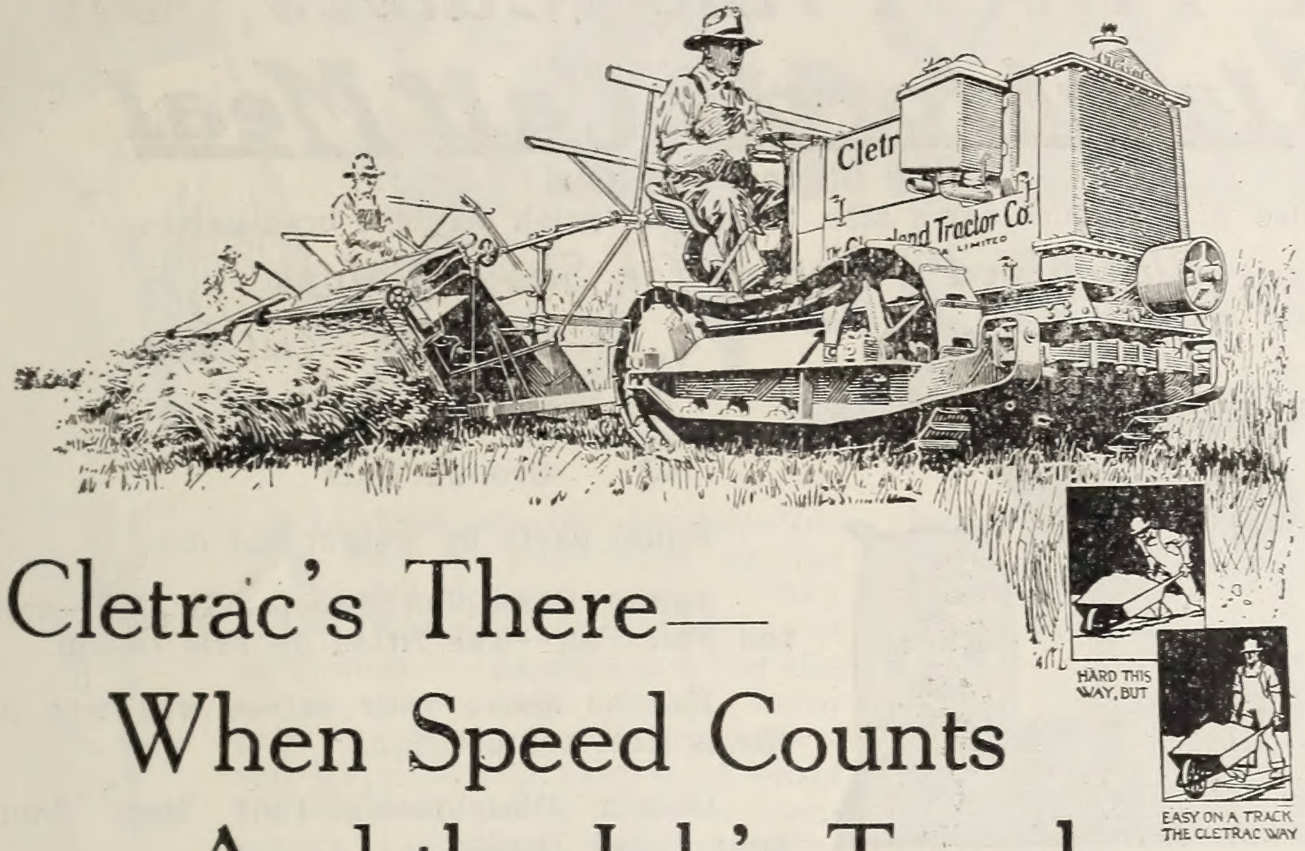
Friday. Two or three short sprints 600 yards at half-mile racing speed.

Saturday. Race day—Half-mile on time.

Notice

The following men are expected to report one week before the regular College opening to commence training; the twelve soccer men will be warned by S. L. Joss Those who intend to return early are requested to notify the College Secretary before 15th September, in order that arrangements may be made for accommodation.

(Continued on P. XXIII.)



Cletrac's There— When Speed Counts And the Job's Tough

Cletrac makes short work of the harvest. Hitched to a binder, it keeps a fast, steady gait without a let-up in the withering summer heat, while horses must stop to cool off. The tireless tank-type tractor never quits till the job's done.

Cletrac does every big farm job and does it well. With its broad flanged tracks firmly gripping the ground, it plows easily even in soft or sandy places. It's made right, too, for every kind of belt job and for hauling your harvest loads.

Cletrac is just what is needed to cut production costs. Replaces three men and six horses. Works as long as it's wanted in any kind of weather, saves weeks every year, and it never costs a cent when idle.

Our interesting booklet, "Selecting Your Tractor," gives full information about Cletrac. Write for your copy to-day.

SPECIFICATIONS

Horsepower.
  12 at draw-bar.
  20 at belt-pulley.
Length: 96 inches.
Width: 50 inches.
Height: 52 inches.
Weight: 3455 lbs.
Turning Circle: 12 feet.
Traction Surface: About 800 square inches.
Centre to centre of tracks: 38 inches.
Belt-pulley: Diameter 8 inches, face 6 inches.

THE
CLEVELAND TRACTOR COMPANY
OF CANADA, LIMITED.

HOME OFFICE:
Windsor, Ontario

WESTERN SALES OFFICE:
261 Fort St., Winnipeg

Cletrac
TANK-TYPE TRACTOR

Fit First Prize Calves On
Blatchford's Calf Meal
(The Original Calf Meal)
Its use will produce extra size, flesh and finish on pure bred calves.
Blatchford's Ration for Show Calves

1/3 Blatchford's Calf Meal
Ground Barley
Ground Oats

Equal parts by weight fed dry,

Junior Champion Sweepstake Calf—Picton Fall Fair—was fitted on this ration.

Fed as above your calves will win in the hottest competition.

Obtain Blatchford's Calf Meal from your Local Dealer.

BLATCHFORD'S CALF MEAL COMPANY
OF CANADA, LIMITED
61-77 Pelham Ave. **Toronto**
(Established in Leicester, England over 120 years ago)

(Continued from P. XXI.)

Rugby

Buckley, Chisholm, Cockburn, Claus, Coon, Dawson, Dixon, Edwards, Hamilton, Hammersley, McArthur, MacMillan, Nichol, H. C. Purdy, Presant, Ross, Richmond, C. A. S. Smith, C. W. Smith, T. Smith, Sheppard, Secord, Stewart, Wildman, T. J. Wood, Ziegler.

Track

Blaney, Burke, Brink, Bates, Broughton, O. Cameron, G. G. Cameron, Carson, Hanlan, Hart, Hinrichs, Moran, J. C. Purdy, Painter, Synnott, Stanley, G. H. Scott, Whitelock, Waugh, Walsh, Wood, Wilson.

TRUE FOR CANADA AS WELL.

"We were founded as a nation of farmers, and in spite of the growth of our industrial life, it still remains true that our whole system rests upon the farm; that the welfare of the whole community depends upon the welfare of the farmer."—*Theodore Roosevelt.*

When tillage begins, other arts follow. The farmers, therefore, are the founders of human civilization.—*Daniel Webster.*

AND THE ROW BEGAN.

It was after horse-judging—the day that Doc had "explained" to Year '23 that "This is not a case of sidebone, but merely the normal protrusion of the distal end of the os suffraginis."

Soph—"A nod is as good as a wink to a blind horse."

Ditto—"Do I understand you to say that a spasmodic movement of the covering of the optic is as adequate as a slight inclination of the cranium to an equine quadruped devoid of its visionary functions?"

"A Barn is only as Permanent as its roof"

ALL business-like farmers to-day are convinced on the idea of permanence. They know that only by building for permanence can they prevent the waste that cuts down farm profits. So we find that progressive Canadian farmers now build foundations of Concrete, construct their farm buildings substantially — using Metal Siding for Barn and Shed walls—and put on every building a roof of

Metal Shingles

But there are still many who have not acted on this "Permanence" policy. Ontario alone loses 1000 barns every year through fire—most of them from lightning, or sparks on the roof, the place where farm fires usually start.

That, then, is the place to put Metal—the substance that fire cannot attack. Metal Shingles, grounded, are sure protection against lightning—and they simply cannot burn. They make a "100 per cent. roof—100 per cent. proof—proof against fire, rain, sleet, snow, wind and the extremes of heat or cold."

First cost, moderate—in ultimate cost the cheapest roof you could buy—because permanent and free from the upkeep expense that makes inferior types of roofing dear at any price.

PRICES AND FULL INFORMATION FROM ANY OF THESE FIRMS:

The Metal Shingle & Siding Co., Limited Preston	*The Pedlar People Limited Oshawa*	*The Galt Art Metal Co. Limited Galt*	*The McFarlane-Douglas Co. Limited Ottawa*	*The Metallic Roofing Co. Limited Toronto*

USE METAL SHINGLES for SAFETY and PERMANENCE

Rock Bottom Prices

A careful survey of the raw material market justifies the opinion that PRESENT SELLING PRICES OF METAL SHINGLES ARE ROCK BOTTOM for the season of 1921.

THE
TWO YEAR COURSE
—AT THE—
Ontario Agricultural College
GUELPH.

Is within the reach of all farm boys
BECAUSE

Ordinary public school education is sufficient for admission in the course.

The College Year begins September 30th and ends April 14th, so that students from the farm may return to their homes to assist in the Spring and Summer work.

Five months during the Spring and Summer gives many students opportunity to earn sufficient money to defray College expenses for the following year.

The tuition fee for Ontario students for two years is only $20.00 per year, while the lowest possible rate is charged for board and room in residence.

A portion of the cost the first year is defrayed by work on the farm and the various departments.

Students wishing to take the full Four Years' Course for the degree of B.S.A., conferred by the University of Toronto, require matriculation standing or its equivalent.

College Opens Sept. 30th
1921.

Write for a College Calendar which gives full particulars.

J. B. REYNOLDS, M.A., President.